U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-278 942

Research, Demonstration, Training and Fellowship Awards October - March FY 1977

Environmental Protection Agency, Washington, D C

Feb 78

EPA GAD/ 1-78-01

PB 278 942

RESEARCH, DEMONSTRATION, TRAINING, and FELLOWSHIP AWARDS

OCT. - MARCH FY 1977

U.S. Environmental Protection Agency
Grants Administration Division (PM-216)
Washington, D.C. 20460

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BIBLIOGRAPHIC DATA SHEET

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EPA-GAD/1-78-01

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Research, Demonstration, Training, and Fellowship Awards
Listing awards during October - March FY 1977

5. Report Date
Feburary 1978

6.

7. Author(s) Special Projects & Control Section
Grants Operations Branch

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Grants Administration Division
Office of Resources Management
Office of Planning & Management
Environmental Protection Agency

10. Project/Task/Work Unit No.

11. Contract/Grant No.
194/03

12. Sponsoring Organization Name and Address
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13. Type of Report & Period Covered
Oct - March FY 1977

14.

15. Supplementary Notes
This is an addition to the series of Awards Registers

16. Abstracts

This publication lists the grant awards offered by EPA during the period of October - March, Fiscal Year 1977, for research, demonstration, training, and fellowship programs.

A brief project description for most of the research and demonstration grants administered by Headquarters is contained in Section Two, arranged in ascending order of the Grant Identification Number. A Grant Number Index is included to assist cross-referencing into Section One material

17. Key Words and Document Analysis. 17a. Descriptors

Water
Awards
ir
Solid Waste
Hazardous Materials

Pesticides
Grants
Radiation
Water Supply
Training

Fellowships

17b. Identifiers/Open-Ended Terms

EPA Awards for research, demonstration, training, and Fellowship programs.

17c. COSATI Field/Group

18. Availability Statement
Release unlimited

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UNCLASSIFIED

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UNCLASSIFIED

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22. Price

INTRODUCTION

This publication provides information about the Environmental Protection Agency's (EPA) research, demonstration, training, and fellowship awards during the period October 1976 - March 1977. It is a companion publication to State and Local Grant Awards which lists awards to State and Local agencies.

The data is organized into two sections:

Section One - Geographic listing by State and program.

Section Two - Grant Number Index and brief project descriptions arranged in ascending order of the Grant Identification Number.

Project descriptions were, for the most part, prepared by the grantees and are provided only for those grants administered by the EPA Headquarters office. The inclusion of this information has proven to be very useful from a management aspect as well as in meeting and fulfilling requirements for providing information to the public.

The Grant Number Index is provided as an aid for cross-referencing information between the two sections. Locating a grant number in this index, the reader will find the name of the applicant and the State location. By referring to that State's listing(s) in Section One, information on that particular grant will be found.

This material was prepared by Lynn Szedon with the assistance of Sandra Artis and Donna Whitaker. Computer programming assistance was provided by Donald L. Thie. We have made what we feel are a few improvements to this publication. The title, formerly the Awards Register, Volume I, has been changed, as well as the cover design. Other changes are under consideration for future issues as we are continually seeking to be as responsive as possible to the needs of our users. Any comments or criticisms should be directed to Lynn Szedon, Grants Operations Branch (PM-216), Grants Administration Division, on (202) 755-3370.

SOURCES OF INFORMATION ON EPA GRANTS AWARDED, REPORTS GENERATED BY GRANTS AND OTHER GRANT RELATED MATERIALS

Research, Demonstration, Training, and Fellowship Awards; 1st Half of FY 1977 (October 1976 - March 1977)

Section I lists research, demonstration, training and fellowship awards by State, program, and grantee name. Each record provides applicant name, municipality, program element, title, project director, Grant Identification Number, type of grant award, date and dollar amount of award. Section II contains brief project descriptions for research and demonstration projects administered by Headquarters and is arranged in ascending order by the Grant Identification Number. An index is provided for cross-referencing the information between Sections I and II. Environmental Protection Agency, EPA-GAD/1-78-01, NTIS number and price to be assigned.

State and Local Grant Awards; 1st Half of FY 1977 (October 1976 - March 1977)

Lists all State and Local Assistance Awards by State, by program, and by grantee name. Format the same as for Research, Demonstration, Training, and Fellowship Awards listed above. Environmental Protection Agency, EPA-GAD/2-78-01, NTIS number and price to be assigned.

Awards Register, Grants Assistance Programs of EPA; Transition Quarter of Fiscal Year 1976
(July-September, 1976)

Volume I.	Section I lists research, demonstration, training and fellowship awards by State, program, and grantee name. Each record provides applicant name, municipality, program element, title, project director, Grant Identification Number, type of grant award, date and dollar amount of award. Section II contains brief project descriptions for research and demonstration projects administered by Headquarters and is arranged in ascending order by the Grant Identification Number. An index is provided for cross-referencing the information between Sections I and II. Section III is a cross-walk for use in identifying the program/subprogram area of a grant in accordance with classifications of our Office of Research and Development. Environmental Protection Agency, EPA-GAD/1-76-005, NTIS order number PB275407/AS, price $8.00.
Volume II.	Lists all State and Local Assistance Awards by State, by program, and by grantee name. Contents and format the same as for Volume I, Section One. Environmental Protection Agency, EPA-GAD/1-76-006, NTIS order number PB275408/AS, price $9.00.

Awards Register, Grants Assistance Programs of EPA; January-June of Fiscal Year 1976

Volume I.	Contents and format the same as for Volume I of the above. Environmental Protection Agency, EPA-GAD/1-76-003, NTIS order number PB260742, price $9.00.
Volume II.	Contents and format the same as for Volume II of the above. Environmental Protection Agency, EPA-GAD/76-004, NTIS order number PB261980, price $11.00.

Awards Register, Grants Assistance Programs of EPA
1st Half Fiscal Year 1976 (July-December, 1975)

Volume I. Section I lists all awards in research, demonstration, training and fellowships. Section II contains a brief description of most research and demonstration projects. Section III provides an index of all awards arranged by subject content according to the fourteen sub-program classifications of our Office of Research and Development. Environmental Protection Agency, EPA-GAD/1-76-001, NTIS order number PB252893, price $5.25.

Volume II. Lists all State and Local Assistance Awards. Environmental Protection Agency, EPA-GAD/1-76-002, NTIS order number PB253091, price $11.00.

Awards Register, Grants Assistance Programs of EPA
2nd Half of Fiscal Year 1975 (January-June 1975)

Volume I. Contents and format the same as for Volume I above. Environmental Protection Agency, EPA-GAD/1-75-003. NTIS order number PB245575, price $10.75, microfiche, $3.00.

Volume II. Contents and format the same as for Volume II above. Environmental Protection Agency, EPA-GAD/1-75-004. NTIS order number PB245576, price $11.75, microfiche $3.00.

Semi-Annual Award Listing, Grants Assistance Programs of EPA; 1st Half Fiscal Year 1975 (July-December 1974)

Volume I. Lists all awards in research, demonstration, training and fellowships. Environmental Protection Agency, EPA-GAD/1-75-001. NTIS order number PB241476, price $5.25, microfiche, $3.00.

Volume II. Lists all State and Local Assistance awards. Environmental Protection Agency, EPA-GAD/1-75-002. NTIS order number PB241400, price $9.00, microfiche, $3.00.

Awards Register, Grants Assistance Programs of EPA
Fiscal Year 1974 (July 1973 - June 1974)

Volume I. Lists all awards in Fiscal Year 1974 except Waste Water Treatment Construction and Waste Water Treatment Reimbursement Awards. NTIS order number PB238370, price $8.00, microfiche, $3.00.

Volume II. Lists only Waste Water Treatment Construction Awards in Fiscal Year 1974. NTIS order number PB238371, price $9.25, microfiche, $3.00.

Volume III. Lists only Wastewater Treatment Reimbursement Awards in Fiscal Year 1974. NTIS order number PB238372, price $9.00, microfiche, $3.00.

Awards Register, Grants Assistance Programs of EPA
Fiscal Year 1973 (July 1972 - June 1973)

The format of this publication has the initial sort by State. Each entry includes grantee identification, program area, grant title, grant number, award date and dollar amount. Environmental Protection Agency 220/1-73-004, NTIS order number PB229827, price $15.25, microfiche, $3.00.

The above publications can be purchased from:

National Technical Information Service (NTIS)
Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
(703) 557-4650

Awards Register, Grants Assistance Programs of EPA
Fiscal Year 1972 (July 1971 - June 1972)

This publication is currently out of print. It is available for reference at all EPA libraries and at EPA Headquarters, Grants Administration Division, 401 M Street SW, Washington, D.C.

Monthly Listing of Awards for Construction Grants for Wastewater Treatment Works

Awards for the wastewater treatment facilities construction grants under Public Law 92-500 made during a particular month are listed in a monthly publication entitled "Monthly Listing of Awards for Construction Grants for Wastewater Treatment Works." This publication is prepared by the Grants Administration Division and distributed and sold by the National Technical Information Serivce.

The March 1974 issue (PB23130) provides a base listing of all grants awarded under Public Law 92-500. Beginning with the April 1974 issue (PB231300-01), the listings will contain awards for one month only and will be numbered in sequence. Microfiche (24X) of each copy is also available. The subscription price is $120.00 for 12 issues. Previous issues can be purchased at $10.50 per copy.

The publication is distributed to subscribers approximately six weeks after the close of the awards-listed month. It may be obtained through:

National Technical Information Service (NTIS)
Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
(703) 557-4650

NOTE: All of the preceeding publications are available for examination at the Grants Administration Division and Library of EPA Headquarters and each Regional Office.

FEDERAL ASSISTANCE PROGRAMS OF THE ENVIRONMENTAL PROTECTION AGENCY

This publication includes descriptive information about Environmental Protection Agency assistance programs reprinted from the Catalog of Federal Domestic Assistance, which was prepared for the Office of Management and Budget. Similar information on programs of all Federal agencies is included in the Catalog which is available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20420 for $18.00 and includes changes as issued for the 1977 edition. It is also available for public use in Federal Depository Libraries.

Copies of this publication my be obtained from the Environmental Protection Agency, Grants Operations Branch, Grants Administration Division (PM-216), Office of Planning and Management, Washington, D.C. 20460.

OTHER GRANT-RELATED INFORMATION

A brief summary of a grant project is available on the majority of research and demonstration grants.

These summaries are available for projects that have received Federal funding. In rare instances, a grant application may contain privileged information and is so designated. For these, only the award data, such as grant number, applicant name, organization, location, grant title, amount awarded, and award date is available. Other information may be available depending on the particular circumstances.

The Smithsonian Science Information Exchange (SSIE), Room 300, 1730 M Street, N.W., Washington, D.C. 20036, receives a copy of the summary of a grant and makes it available to the public on a fee basis. The cost of a print-out, if the Agency is identified and the grant or contract number is provided, costs $2.00 per grant number with a $10.00 minimum fee. A search on a subject (topic) is $60.00 per search service for 1 to 50 titles, and an additional charge of 25¢ per title. A search on the investigator's name can also be performed. All inquiries and requests for this service should be addressed to SSIE or phone (202) 381-4211.

REPORTS GENERATED BY GRANT SUPPORTED PROJECTS

Final reports and other program reports generated by grant supported projects are published and made available if merited. Final report information is available from the following program offices:

For solid waste management and resource recovery:

Publication and Distribution Unit
Office of Solid Waste Management
Environmental Protection Agency
Cincinnati, Ohio 45268

For air pollution control:

Library MD-35
Environmental Protection Agency
Research Triangle Park, North Carolina 27711

For pesticide publications:

Information Section WH-569
Office of Pesticide Programs
Environmental Protection Agency
401 M Street SW
Washington, D.C. 20460

For other research and demonstration projects:

Technology Transfer Staff
Office of Research and Development
Environmental Protection Agency
Cincinnati, Ohio 45268

EPA REPORTS BIBLIOGRAPHY QUARTERLY SUPPLEMENT

(sponsored by Library Systems Branch)

The EPA Cumulative Bibliography 1970-1976 published in December 1976 (order number PB265920, price code E99) contains a bibliographic citation with abstracts for reports generated by EPA and its predecessor agencies and entered into the NTIS collection through 1976. Access points to this information are by Report Title; Subject (keyword); Corporate or Personal Author; Contract Number; and Accession/Report Number.

Beginning in March 1977, quarterly update supplements will be published listing and indexing EPA technical reports and journal articles entered into the NTIS collection during the preceding quarter. An additional index titled "Sponsoring EPA Office" is included as well. The fourth quarterly issue will cumulate and become the annual index for the year.

To order documents or subscriptions, contact the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161. Do not order from the U.S. Environmental Protection Agency. If what you have ordered is in stock on hand, you should receive your order within two weeks after it arrives at NTIS. If what you have ordered must be reproduced from a microform, or if all the paper copies have been sold and reprints are in process, you should receive your order within four to six weeks. Infrequently, orders may be further delayed by a contractor's inability to deliver to NTIS. You will be notified if such a delay is expected.

This EPA Reports Bibliography Quarterly Supplement series is available on annual subscription from NTIS at a cost of $45.00 for North American Continent users (single copies, when available, are $12.50 each). For those outside the North American Continent, please write NTIS for prices.

The following EPA libraries maintain for reference purposes completed sets of EPA reports on microfiche.

Region I Library
Room 2211-B, JFK Federal Bldg.
Boston, Massachusetts 02203

National Marine Water Quality Lab
P. O. Box 277
West Kingston, Rhode Island 02892

Region II Library
26 Federal Plaza
New York, New York 10007

Region II Field Office Library
Edison, New Jersey 08817

Region III Library
Curtis Bldg., 6th & Walnut Streets
Philadelphia, Pennsylvania 19106

Headquarters Library, Room 2404 WSM
401 M Street, S.W.
Washington, D.C. 20460

Region IV Library
345 Courtland Street, N.E.
Atlanta, Georgia 30309

Library Services MD-35
Research Triangle Park
North Carolina 27711

Southeast Environmental Research Lab
College Station Road
Athens, Georgia 30601

Gulf Breeze Laboratory
Sabine Island, Bldg. 29
Gulf Breeze, Florida 32561

Region V Library
230 Dearborn Street Rm. 1455-A
Chicago, Illinois 60604

Environmental Research Center Library
26 West St. Clair Street
Cincinnati, Ohio 45268

Environmental Research Lab-Duluth
6201 Congdon Boulevard
Duluth, Minnesota 55804

Region VI Library
First International Bldg.
1201 Elm Street
Dallas, Texas 75270

Robert S. Kerr Environmental Research Laboratory
P. O. Box 1198
Ada, Oklahoma 74820

Region VII Library
1735 Baltimore Avenue, Room 249
Kansas City, Missouri 64108

Region VIII Library, 8M-ASL
1860 Lincoln Street
Denver, Colorado 80225

National Field Investigation Center
Room A-1209. Bldg. 53
Box 25227, Denver Federal Center
Denver, Colorado 80225

Region IX Library
100 California Street
San Francisco, California 94111

National Environmental Research Center
P. O. Box 15027
Las Vegas, Nevada 89114

Region X Library
1200 Sixth Avenue
Seattle, Washington 98101

National Environmental Research Center
200 S.W. 35th Street
Corvallis, Oregon 97330

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
A L A B A M A						
** RESEARCH **						
ALABAMA A&M UNIV. NORMAL	MICROBIAL DEGRADATION OF CHLORINATED HYDROCARBON PESTICIDES IN FRESHWATER ECOSYSTEMS	SAVAGE, JACOB	80393301	NEW	76/12/30	$52,531
AUBURN UNIV. AUBURN	ENGINEERING PERFORMANCE OF THERMOPLASTIC WATER WELL CASINGS	WARMAN, J. C.	80501501	NEW	77/02/16	$72,198
AUBURN UNIV/ALABAMA TEXTILE EDUC PROG. AUBURN	RECLAIMATION OF TEXTILE WARP SIZE USING THERMAL PRECIPITATION	WARMAN, J. C.	80512801	NEW	77/03/01	$98,222

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	A L A S K A					
** RESEARCH **						
ALASKA, UNIV, OF FAIRBANKS	DEFINITION OF ALASKAN WETLAND BY FLORISTIC CRITERIA	MURRAY, DAVID F,	80496501	INCR	77/03/28	$2,800

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
A R I Z O N A						
** RESEARCH **						
ARIZONA, UNIV. OF TUCSON	MODE OF ACTION OF CYCLODIENE INSECTICIDES	CROWDER, L.	80435102	CONT	77/01/18	$26,711
** DEMONSTRATION **						
ARIZONA DEPT OF HEALTH SERVICES PHOENIX	IMPLEMENTATION OF ARIZONA'S SOLID WASTE MANAGEMENT PLAN	BECK, JOHN H.	00909102	CONT	76/12/13	$59,000

APPLICANT MUNICIPALITY	PROJECT DIRECTOR / FELLOW TITLE	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	CALIFORNIA				
** RESEARCH **					
CALIFORNIA, UNIV. OF RIVERSIDE	PITTS, J. N. MECHANISMS OF PHOTOCHEMICAL REACTION IN URBAN AIR	80064918	CONT	76/12/14	$117,000
CALIFORNIA, UNIV. OF LOS ANGELES	MURTHY, VRUDHULA K. MODELS FOR MORTALITY RATES & SURVIVORSHIP	80379101	INCR	76/12/30	$7,265
CALIFORNIA, UNIV. OF LOS ANGELES	VALENTINE, JANE L. HUMAN BODY BURDENS OF ARSENIC & SELENIUM AS A RESULT OF WATER CONTAMINATION	80379802	CONT	77/02/04	$332,851
CALIFORNIA, UNIV. OF DAVIS	ROSSTON, DENNIS E. FIELD MEASUREMENT OF DENITRIFICATION	80425901	INCR	77/02/23	$6,214
CALIFORNIA, UNIV. OF RIVERSIDE	FUKUTO, T. R. CHEMISTRY AND MODE OF ACTION OF INSECTICIDES	80434502	CONT	77/02/14	$106,475
CALIFORNIA, UNIV. OF SANTA BARBARA	HORVATH, STEVEN M. EFFECT OF LOW LEVELS OF SULFURIC ACID MIST EXPOSURE ON HUMAN PULMONARY FUNCTION	80485301	NEW	76/11/23	$242,231
CALIFORNIA, UNIV. OF SANTA BARBARA	OFFEN, HENRY W. OIL SPILL & OIL POLLUTION REPORTS	80505201	NEW	77/02/08	$49,056
LOMA LINDA UNIV. LOMA LINDA	ABBEY, D. E. INCIDENCE OF CHRONIC DISEASE IN HUMANS EXPOSED TO PHOTOCHEMICAL AIR POLLUTION	80460301	NEW	77/03/28	$81,918
SAN JOSE STATE UNIV. FDN. SAN JOSE	HARVEY, HARRY T. TRANSITION ZONE BETWEEN MARSH & UPLANDS	80496401	INCR	77/03/25	$2,000
SCRIPPS CLINIC & RES. FDN. LAJOLLA	DANDLIKER, W. EFFECTS OF PESTICIDES ON THE IMMUNE RESPONSE	80388502	CONT	77/02/02	$74,149

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	C A L I F O R N I A					
** RESEARCH **						
STANFORD RES. INST. MENLO PARK	ATMOSPHERIC FATES OF HALOGENATED COMPOUNDS	SINGH, HANWANT SIR	80380202	INCR	77/03/29	$75,000
STANFORD RES. INST. MENLO PARK	IDENTIFICATION OF RES. DEVELOPMENT & DEMO. NEEDS FOR POLLUTION CONTROL IN FOOD INDUSTRY	JONES, J. L.	80464201	INCR	77/01/18	$4,038
STANFORD UNIV. STANFORD	ANALYTICAL METHODS EVALUATION FOR APPLICABILITY IN LEACHATE ANALYSIS	MCCARTY, P. L.	80488301	NEW	76/11/23	$55,560
** DEMONSTRATION **						
CALIFORNIA RESOURCES AGENCY SACRAMENTO	SOLID WASTE PROGRAM IMPLEMENTATION & DEMONSTRATION	ALBERT A MARINO	00913701	NEW	77/01/28	$80,000
CALIFORNIA STATE DEPT. OF HEALTH SACRAMENTO	IMPLEMENTATION OF ENFORCEMENT ACTIVITIES OF CALIFORNIA'S HAZARDOUS WASTE MANAGEMENT PROGRAM	COLLINS, HARVEY F.	00913501	NEW	76/11/18	$135,000
EAST BAY MUN. UTILITY DIST. OAKLAND	RESTORATION OF LAFAYETTE RESERVOIR	LARKIN, D. G.	80489501	NEW	77/03/01	$37,000
EAST BAY REGIONAL PARK DIST. OAKLAND	LAKE RESTORATION DEMONSTRATION PROJECT BY DREDGING & CHEMICAL TREATMENT (TEMESCAL LAKE)	TRUDEAU, R. C.	80489701	NEW	77/03/31	$244,486
MOUNTAIN VIEW, CITY OF MOUNTAIN VIEW	SHORELINE REGIONAL PARK GAS RECOVERY PROJECT	CARLSON, JOHN A.	80339601	INCR	77/03/25	$15,100
** TRAINING **						
CALIFORNIA WATER RESOURCES CONTROL BD. SACRAMENTO	ESTABLISH WASTEWATER TREATMENT PLANT OPERATOR TRAINING PROGRAM	DENDY, BILL	00912401	INCR	76/10/12	$10,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD

C O L O R A D O

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
COLORADO STATE UNIV. FORT COLLINS	VEGETATIVE STABILIZATION PARAHO SPENT OIL SHALE	BERG, WILLIAM A.	80378802	INCR	76/12/30	$23,630
COLORADO STATE UNIV. FORT COLLINS	DEVELOP GENERALIZED PLANNING MODEL FOR EVALUATION OF ALTERNATIVE FOREST MGMT PRACTICES (ENGR. PHASE)	SIMONS, D. B.	80513101	NEW	77/03/18	$150,000
COLORADO, UNIV. OF BOULDER	HEALTH EFFECTS OF CONSUMPTION OF RENOVATED WATER - CHEMISTRY & CYTOTOXICITY	CHAPPELL, W. R.	80396802	CONT	76/11/15	$72,033

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	C O N N E C T I C U T					
** DEMONSTRATION **						
ENFIELD, TOWN OF ENFIELD	LEACHATE TREATMENT BY ANAEROBIC FILTER	MULLINS, ROGER	80362701	INCR	76/12/30	$34,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	DELAWARE					
** RESEARCH **						
DELAWARE, UNIV. OF NEWARK	HINDRANCE OF COLIFORMS RECOVERY BY TURBIDY AND NON COLIFORMS	HERSON, D. S.	80510201	NEW	77/02/16	$37,520

D I S T R I C T   O F   C O L U M B I A

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
NATIONAL ACADEMY OF SCIENCE WASHINGTON	INTERNATIONAL ENVIRONMENTAL PROGRAM COMMITTEE	SCHAD, T. M.	80506701	NEW	76/11/30	$66,666
NATIONAL ACADEMY OF SCIENCES WASHINGTON	ACADEMY FORUM ON COAL	WHITE, R. R.	80525001	NEW	77/03/31	$25,000
SMITHSONIAN INST. WASHINGTON	NON-POINT POLLUTION STUDIES ON AGRICULTURAL LAND TYPES PREVALENT IN THE COASTAL PLAIN ZONE OF MARYLA	CORRELL, DAVID L.	80453601	INCR	76/11/30	$30,000
** DEMONSTRATION **						
INTERNATIONAL CITY MANAGEMENT ASSOC. WASHINGTON	SOLID WASTE TECHNICAL ASSISTANCE FOR LOCAL GOVERNMENT MANAGERS	BARTOLOTTA, ROBERT J.	80436001	INCR	77/02/02	$24,829
** TRAINING **						
CONSERVATION FDN,INC. WASHINGTON	ORGANIZATION OF TRAINING CONFERENCES & TRAINING OF SCIENTIFIC & LAY PERSONNEL IN POLICIES & PROCEDUR	DAVIES, J. C.	90062901	NEW	76/11/23	$130,911
INTERNATIONAL INST FOR ENVRN & DEVELOP WASHINGTON	SUPPORT OF IIED SYMPOSIA	STEIN, R. E.	90065101	NEW	76/12/07	$4,000
NATIONAL ASSOC OF CONSERV DISTRICTS WASHINGTON	EDUCATION & TECHNICAL TRANSFER FOR NON-POINT POLLUTION CONTROL PROGRAMS	UNGER, DAVID G.	90057401	INCR	76/12/27	$34,402
NATIONAL ASSOC. OF COUNTIES RES. FDN. WASHINGTON	TECHNICAL ASSISTANCE FOR COUNTIES IN SOLID WASTE MANAGEMENT	BULGER, THOMAS J.	90065701	NEW	77/02/02	$42,996
NATIONAL ASSOC. OF. CNTY. WASHINGTON	PROJECT TO ASSIST LOCAL GOVERNMENTS TO IMPLEMENT WASTEWATER CONSTRUCTION PROJECTS	HASLIN, WILLIAM R.	90057001	INCR	77/01/05	$249,954

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	D I S T R I C T O F C O L U M B I A					
** TRAINING **						
NATIONAL WILDLIFE FED. WASHINGTON	RURAL SOLID WASTE MANAGEMENT EDUCATION PROGRAMS	HAMPTON, K. R.	90064101	NEW	76/11/17	$59,806
NATIONAL WILDLIFE FEDERATION WASHINGTON	TRAINING PROGRAM FOR CITIZEN PARTICIPATION IN 208 PLANNING	GOLTEN, R. J.	90063301	NEW	76/10/08	$53,500
URBAN ENVRN. CONFERENCE, INC. WASHINGTON	REGIONAL WORKSHOPS TO INCREASE PUBLIC PARTICIPATION OF LABOR, MINORITY & ENVRN. ORGANIZATIONS	COLING, GEORGE	90064301	NEW	77/01/18	$66,300
URBAN LAND INST. WASHINGTON	IMPROVE AWARENESS OF DEVELOPMENT INDUSTRY/ PUBLIC OFFICIALS TO WATER POLLUTION MITIGATION TECHNIQUES	SCHNIDMAN, FRANK	90065301	NEW	77/02/01	$42,732

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	FLORIDA					
** RESEARCH **						
FLORIDA A&M UNIV, TALLAHASSEE	INDIVIDUAL & SYNERGISTIC EFFECTS OF PESTICIDES ON AQUATIC ORGANISMS	SUBRAHMANYAM, C. B.	80378601	INCR	77/03/18	$12,378
FLORIDA STATE UNIV. TALLAHASSEE	ELEMENTAL QUANTITATIVE ANALYSIS OF AIR PARTICULATE MATTER BY PROTON SCATTERING	NELSON, J. WILLIAM	80291303	INCR	76/11/23	$21,000
FLORIDA STATE UNIV. TALLAHASSEE	MESOSCALE SULFUR BALANCE STUDIES	WINCHESTER, J.	80388702	CONT	77/03/17	$80,000
FLORIDA STATE UNIV. TALLAHASSEE	HIGH SENSITIVITY FT NMR STUDIES OF ENVIRONMENTAL TOXIC MATERIALS	LEVY, GEORGE C.	80491601	NEW	77/02/08	$34,525
MIAMI, UNIV. OF CORAL GABLES	STORAGE & EXCRETION OF HALOGENATED & NON-HALOGENATED ORGANOPHOSPHOROUS PESTICIDES IN ANIMALS & MAN	ENOS, H.	80435302	CONT	77/02/07	$74,801

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	GEORGIA					
** RESEARCH **						
GEORGIA, UNIV. OF ATHENS	NEW LIQUID-CHROMATOGRAPHIC DETECTION SYSTEM FOR ENVRN. POLLUTANTS	CARREIRA, L. A.	80415502	CONT	77/01/05	$149,400
GEORGIA, UNIV. OF ATHENS	SEVENTH SYMPOSIUM ON ANALYTICAL CHEMISTRY OF POLLUTANTS	ROGERS, L. B.	80519701	NEW	77/02/08	$20,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	H A W A I I					
** RESEARCH **						
HAWAII, UNIV. OF KANEOHE	RESPONSES OF A TROPICAL ESTUARY TO RELAXATION OF SEWAGE STRESS	SMITH, S.	80398302	CONT	77/03/25	$184,160

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	I L L I N O I S					
** RESEARCH **						
DEPAUL UNIV. CHICAGO	POLYCHLOROBIPHENYLS IN THE ATMOSPHERE & IN PRECIPITATION IN THE LAKE MICHIGAN BASIN	MURPHY, THOMAS J.	80391501	INCR	77/02/23	$1,390
IIT RES. INST. CHICAGO	EFFECTS OF INDUSTRIAL PARICULATE EMISSIONS ON ALVEOLAR MACROPHAGES	ARANYI, C.	80514101	NEW	77/03/01	$74,989
IIT RESEARCH INST. CHICAGO	TRACHEAL ORGAN CULTURE AS AIR POLLUTION DAMAGE INDICATOR	SCHIFF, L. J.	80504901	NEW	77/01/26	$196,000
ILLINOIS, UNIV. OF URBANA	EFFECT OF MOISTURE REGIMEN ON SOLID WASTE STABILIZATION	CHIAN, E. S. K.	80365202	CONT	77/02/16	$10,007
			80365202	INCR	77/03/31	$9,788
ILLINOIS, UNIV. OF URBANA	MINERAL MATTER IN COAL	GLUSKOTER, H.	80440302	CONT	77/03/25	$53,994
ILLINOIS, UNIV. OF CHICAGO	HEALTH EFFECTS OF AEROSOLS EMITTED FROM AN ACTIVATED SLUDGE PLANT	NEAL, ANNEKE	80500301	INCR	77/03/18	$75,416
INTERNATIONAL CONGRESS OR RADIATION RE ARGONNE	FIFTH INTERNATIONAL CONGRESS OF RADIATION RESEARCH, SEATTLE, JULY 14-20, 1974	SINCLAIR, WARREN K.	80305401	NEW	77/03/22	$12,000
NEW YORK STATE DEC ALBANY	GENESEE RIVER PILOT WATERSHED STUDY/WYOMING, YATES & LIVINGSTON CNTYS.	LEO J METLING DIR	00514401	INCR	76/11/12	$263,000
			00514401	INCR	77/02/07	$70,342

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
I L L I N O I S						
** DEMONSTRATION **						
ILLINOIS, STATE OF SPRINGFIELD	LAKE IMPROVEMENTS (FRANK HOLTON STATE PARK)	MILLER, T.	80496201	NEW	77/03/16	$927,000
SPRINGFIELD, CITY OF SPRINGFIELD	SPRINGFIELD, ILLINOIS RESOURCE RECOVERY IMPLEMENTATION GRANT	CHAMBERS, M. O.	80479101	INCR	77/02/23	$25,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
I N D I A N A						
** RESEARCH **						
NOTRE DAME, UNIV. OF NOTRE DAME	NOVEL CONCEPTS METHODS & ADVANCED TECHNOLOGY IN PARTICULATE-GAS LABORATORY	ARIMAN, T.	80514801	NEW	77/01/05	$14,188
NOTRE DAME, UNIV. OF NOTRE DAME	DISSOLVED OXYGEN MEASUREMENTS IN INDIANA STREAMS DURING URBAN RUNOFF	KETCHUM, L.	80520201	NEW	77/03/09	$13,712
PURDUE RES. FDN. LAFAYETTE	EFFECTS OF HALOGENATED AROMATIC HYDROCARBONS ON THE METABOLISM OF FOREIGN ORGANIC COMPOUNDS	CARLSON, G. P.	80507001	NEW	77/02/23	$121,722
** DEMONSTRATION **						
NOBLE CNTY. SOIL & WATER CONSERV. DIST LARWILL	RESTORATION OF SKINNER LAKE IN NOBLE CNTY.	SHERWIN, HUGH	80469501	INCR	77/02/28	$60,247

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
I O W A						
** RESEARCH **						
AMES, CITY OF AMES	EVALUATION OF AMES SOLID WASTE RESOURCES AND ENERGY RECOVERY SYSTEM	CHANTLAND, A.	80390302	CONT	77/03/25	$350,000
SOUTHERN IOWA COUNCIL OF GOVERMENTS CRESTON	SECOND YEAR FUNDING FOR TWO CSA SUPPORTED ELEMENTSOF PROGRAM	LANA, PATRICK G EXEC D	00710001	INCR	76/12/10	$29,500
** DEMONSTRATION **						
LENOX MUN, WATERWORKS LENOX	LENOX MUN, WATER RESERVIOR RESTORATION	DAVIS, P.	80496101	NEW	77/03/08	$100,000
OELWEIN, CITY OF OELWEIN	LAKE OELWEIN RENOVATION PROJECT	HULL, LOUIS	80491201	NEW	77/03/11	$59,490
** TRAINING **						
ASSOCIATION OF BOARDS OF CERTIFICATION AMES	CERTIFICATION EXAMINATION DEVELOPMENT PACKAGE (WATER & WASTEWATER)	SAUCIER, JOHN	90054101	INCR	77/01/05	$49,680

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		KANSAS				
** RESEARCH **						
ASSOCIATION OF SYSTEMATICS COLLECTIONS LAWRENCE	REVIEW OF BIO-STORET SPECIES REFERENCE LIST	EDWARDS, S. R.	80502001	NEW	77/03/28	$10,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	KENTUCKY					
** RESEARCH **						
INTERSTATE MINING COMPACT COMM. LEXINGTON	AUDIOVISUAL PROGRAM FOR SURFACE COAL MINING & THE ENVRN.	BOWLING, K. C.	80497201	NEW	77/01/18	$88,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
L O U I S I A N A						
** RESEARCH **						
TULANE UNIV. NEW ORLEANS	HEALTH RISKS ATTRIBUTABLE TO THE INGESTION OF CLAMS	GOTTLIEB, M. S.	80506601	NEW	77/03/01	$92,621
** DEMONSTRATION **						
AMERICAN SHRIMP CANNERS ASSOC. NEW ORLEANS	SHRIMP CANNERY WASTEWATER TREATMENT DEMONSTRATION PROJECT	SELLY, PAUL	80333801	INCR	77/01/04	$46,500

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	M A I N E					
** RESEARCH **						
MAINE MUN, ASSOC. AUGUSTA	SEPTAGE TREATMENT/MANAGEMENT	SALISBURY, J.	80480401	INCR	77/03/11	$45,900

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
M A R Y L A N D						
** RESEARCH **						
CHESAPEAKE COLLEGE WYE MILLS	FLUORESCENCE OF CHESAPEAKE BAY WATER	PAUL, F. W.	80495601	NEW	77/02/08	$5,700
MARYLAND, UNIV. OF BALTIMORE	EFFECTS OF SULFURIC ACID AEROSOL UPON RESPIRATORY FUNCTION IN NORMAL HUMAN SUBJECTS	BROWN, R.	80480301	NEW	77/01/04	$225,744
** TRAINING **						
CHARLES CNTY. COMM. COLLEGE LAPLATA	WATER POLLUTION CONTROL TRAINING & MATERIAL DEVELOPMENT	SCHWING, CARL M.	90061401	INCR	77/02/23	$28,000
			90061401	INCR	77/03/29	$80,000

M A S S A C H U S E T T S

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
BOSTON UNIV. BOSTON	SUBLETHAL EFFECTS OF OIL ON BEHAVIOR & CHEMICAL SENSES OF MARINE ANIMALS	ATEMA, J.	80383302	CONT	77/01/19	$60,000
HARVARD UNIV. CAMBRIDGE	EFFECTS OF SO2 AND SULFATES ON RESPIRATORY DEFENSE MECHANISMS	BRAIN, J. D.	80509101	NEW	77/01/19	$67,947
MASSACHUSETTS INST. OF TECH. CAMBRIDGE	CATALYTIC DESULFURIZATION & DENITROGENATION	SATTERFIELD, C. N.	80412302	INCR	77/03/18	$10,300
** DEMONSTRATION **						
BROCKTON, CITY OF BROCKTON	ELLIS BRETT POND RESTORATION PROJECT	DORGAN, J.	80500101	NEW	77/01/05	$106,500
W. R. GRACE AND CO. LEXINGTON	TREATMENT OF WASTEWATERS FROM ADHESIVES & SEALANTS MANUFACTURE BY ULTRAFILTRATION	PECEVICH, JOHN	80435001	INCR	77/01/18	$19,125
** TRAINING **						
BOSTON COLLEGE WESTON	STATE STAFF EDUCATION AND TRAINING	THEODORE H. RIDER	00108701	INCR	76/12/09	$5,000
MASSACHUSETTS INST. OF TECH. CAMBRIDGE	LOCAL PARTICIPATION IN WATER PLANNING PROCESSES	ASHFORD, N. A.	90064901	NEW	77/01/12	$36,112

M I C H I G A N

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
COATING CONSULTANT BRIGHTON	METAL FINISHING: PAINTING WASTE LOAD STUDY	BREWER, GEORGE	80346701	NEW	77/03/23	$16,481
MICHIGAN STATE UNIV EAST LANSING	POLLUTION OF GREAT LAKES BY LAND USE PRACTICES & FRUIT ORCHARD FARMING	THOMAS G BARR DIR	00514301	INCR	76/11/02	$192,021
			00514301	INCR	77/02/09	$5,000
MICHIGAN STATE UNIV. EAST LANSING	ECOSYSTEM RESPONSES TO ALTERNATIVE PESTICIDES IN THE ENVRN.	GOODMAN, E. D.	80385903	CONT	77/02/23	$130,656
MICHIGAN, UNIV. OF ANN ARBOR	LONG PATH AIR POLLUTION MONITOR EVALUATION	BARTMAN, F. L.	80339903	CONT	76/12/07	$30,000
MICHIGAN, UNIV. OF ANN ARBOR	OPTIMAL SAMPLING STRATEGIES FOR WATER QUALITY IN LARGE LAKES	CANALE, R. P.	80375402	CONT	76/11/30	$23,559
MICHIGAN, UNIV. OF ANN ARBOR	CHEMICAL AMPLIFIERS AS ODD HYDROGEN RADICAL DETECTORS	STEDMAN, DONALD H.	80460701	INCR	76/11/24	$22,038
MICHIGAN, UNIV. OF ANN ARBOR	DEVELOPMENT & APPLICATION OF AN OZONE VOLTOMETRIC MEMBRANE ELECTRODE	MANCY, KHALIL H.	80463401	NEW	76/11/23	$50,342
MICHIGAN, UNIV. OF ANN ARBOR	HEALTH EFFECTS OF WASTEWATER TREATMENT FACILITY	COCHRAN, K.	80497301	NEW	77/01/12	$21,112
MICHIGAN, UNIV. OF ANN ARBOR	DEVELOPMENT OF AN IN VITRO SYSTEM FOR THE EVALUATION OF TERATOGENS	BEAUDOIN, A.	80512501	NEW	77/01/19	$32,866

M I C H I G A N

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MICHIGAN, UNIV. OF ANN ARBOR	ANALYSIS OF PLANKTONIC DIATOMS FROM LAKE MICHIGAN WATER	BEETON, R.	80513301	NEW	77/03/04	$11,038
MICHIGAN, UNIV. OF ANN ARBOR	HEAVY METAL ACCUMULATION IN BENTHIC ALGAL COMMUNITIES	SICKO-GOAD, LINDA	80514601	NEW	77/02/23	$30,235
NATIONAL SAN. FDN. ANN ARBOR	THIRD NATIONAL CONFERENCE ON INDIVIDUAL ONSITE WASTEWATER SYSTEMS	MCCLELLAND, N. I.	80502301	NEW	76/12/28	$10,000

M I N N E S O T A

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
MINNESOTA, UNIV. OF ST PAUL	EFFECT OF NEMADJI RIVER INPUT IN LAKE SUPERIOR	M SYDOR PROF	00528601	INCR	77/02/09	$5,211
MINNESOTA, UNIV. OF MINNEAPOLIS	EFFECT OF CYANIDE ON FRESHWATER FISH AND INVERTEBRATES	SMITH, LLOYD L.	80291403	INCR	77/01/05	$40,900
MINNESOTA, UNIV. OF ST. PAUL	FORMATION OF ATMOSPHERIC AEROSOLS	WHITBY, KENNETH	80385102	INCR	77/01/26	$73,826
MINNESOTA, UNIV. OF ST. PAUL	EFFECTS OF H2SO4 AEROSOL ON VEGETATION	KRUPA, S.	80429102	CONT	77/02/08	$30,000
MINNESOTA, UNIV. OF ST. PAUL	REYE'S SYNDROME & TISSUE ORGANOCHLORIDES/ OTHER CHEMICAL RESIDUES	ROWE, R. G.	80512601	NEW	77/01/04	$60,000
** DEMONSTRATION **						
BLOOMINGTON, CITY OF BLOOMINGTON	PENN LAKE RESTORATION PROJECT	LANGSETH, R. L.	80471201	NEW	77/03/21	$87,900
RAMSEY CNTY. ST. PAUL	LAKE IMPROVEMENT FOR LAKE PHALEN	FINLEY, J. T.	80469001	NEW	77/01/18	$575,683
RICE CREEK WATERSHED DIST. ARDEN HILLS	LONG LAKE RESTORATION	DIMKE, B. V.	80473001	NEW	76/12/30	$1,296,715
** FELLOWSHIPS **						
MINNESOTA, UNIV. OF MINNEAPOLIS	PUBLIC HEALTH	MONSON, RAYMOND E.	91052101	INCR	76/12/30	$205

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
M I N N E S O T A						
** FELLOWSHIPS **						
MINNESOTA, UNIV. OF MINNEAPOLIS	PH.D./PUBLIC HEALTH	RITCHIE, I.	91055001	INCR	77/03/03	
MINNESOTA, UNIV. OF MINNEAPOLIS	M.S./PUBLIC HEALTH	SHEPHERD, HOMER E.	91056101	INCR	77/02/16	$399
MINNESOTA, UNIV. OF MINNEAPOLIS	M.S./PUBLIC HEALTH/FULL TIME AGENCY	OBERTA, ANDREW F.	91056201	INCR	76/12/28	$331
MINNESOTA, UNIV. OF MINNEAPOLIS	PH.D./ENVRN. HEALTH	RITCHIE, INGRID M.	91098901	NEW	77/02/28	$6,283

MISSISSIPPI

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MISSISSIPPI STATE UNIV. MISSISSIPPI STAT	DETERMINATION OF SITE(S) OF ACTION OF SELECTED PESTICIDES BY ENZYMATIC-IMMUNOBIOLOGICAL APPROACH	KOCH, ROBERT B.	80345802	INCR	77/01/19	$1,318
MISSISSIPPI STATE UNIV. MISSISSIPPI STAT	DETERMINATION OF SITE(S) OF ACTION OF SELECTED PESTICIDES BY ENZYMATIC-IMMUNOBIOLOGICAL APPROACH	KOCH, R. B.	80345803	CONT	77/01/19	$25,000
			80345803	INCR	77/03/09	$10,680

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MISSOURI						
** RESEARCH **						
MISSOURI, UNIV, OF ROLLA	RADIUS OF INFLUENCE OF SUBSURFACE INJECTION WELLS	WARNER, D. L.	80503901	NEW	77/02/23	$60,084
ST. LOUIS UNIV. ST. LOUIS	SERIAL MEASUREMENT OF PULMONARY FUNCTION IN OUTDOOR WORKERS IN ST. LOUIS METRO. AREA	SLAVIN, R.	80500601	NEW	77/01/05	$75,658
WASHINGTON UNIV ST. LOUIS	SULFUR BUDGET IN LARGE PLUMES	HUSAR, R. B.	80389601	INCR	77/01/26	$16,710
			80389601	INCR	77/02/16	$30,000
WASHINGTON UNIV. ST. LOUIS	SYMPOSIUM ON SULFUR IN THE ATMOSPHERE	HUSAR, RUDOLF B.	80504301	NEW	77/02/23	$23,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
M O N T A N A						
** RESEARCH **						
HELENA DEPT. HEALTH & ENVRN. SCIENCES HELENA	EFFECTS OF PARTICLE SIZE ON LANDFILLED SOLID WASTE: COLD CLIMATE STUDIES	CARMODY, T. D.	80501201	NEW	77/01/05	$50,000
MONTANA, STATE OF HELENA	ONS IN NE MONT PRIOR TO IMPACTS FROM COAL PLANT	WILLIAM CHRISTIANSEN,	00818701	NEW	77/01/12	$120,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
N E V A D A						
** RESEARCH **						
NEVADA, UNIV, OF LAS VEGAS	REMOTE SENSING TO DETERMINE HORIZONTAL DISTRIBUTION OF CHLOROPHYLL & SURFACE CURRENTS LAS VEGAS BAY	BEACON, J. E.	80504501	NEW	77/02/02	$10,831
** DEMONSTRATION **						
NEVADA DEPT OF HUMAN RESOURCES CARSON CITY	IMPLEMENTATION OF NV SOLID WASTE PLAN	H LAVERNE ROSSE	00913401	NEW	76/10/05	$46,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
NEW JERSEY						
** RESEARCH **						
AMERICAN ELECTROPLATERS' SOCIETY EAST ORANGE	EVALUATION OF NEW REVERSE OSMOSIS MEMBRANES FOR PLATING WASTE TREATMENT	SCHUMACHER, J. HOWARD	80431101	INCR	77/02/23	$11,976
EDGEWATER, BORO OF EDGEWATER	UPGRADING PRIMARY TANKS WITH ROTATING BIOLOGICAL CONTRACTORS	COLLINS, DAVID P.	80485401	INCR	77/03/31	$20,000
NEW JERSEY INST. OF TECH. NEWARK	MODIFIED WET SCRUBBING OF IMMISCIBLES EMITTED FROM MANUFACTURE & PROCESSING OF ORGANIC PRODUCTS	CHEREMISINOFF, PAUL N.	80445501	INCR	77/02/23	$30,000
PRINCETON UNIV. PRINCETON	PYROLYSIS OF AGRICULTURAL RESIDUES & FEEDLOT WASTES IN REACTIVE STEAM ATMOSPHERE	ANTAL, MICHAEL J.	80483601	NEW	76/12/14	$85,585
RUTGER STATE UNIV. NEW BRUNSWICK	REVIEW & ANALYSIS OF OIL/WATER SEPARATION LITERATURE	AHLERT, ROBERT C.	80397801	INCR	77/01/12	$4,915
RUTGERS STATE UNIV. NEW BRUNSWICK	FRESHWATER MARSHES: PRESENT STATUS, FUTURE NEEDS CONFERENCE	GOOD, R. E.	80509001	NEW	76/12/14	$10,000
TEXTILE RESEARCH INST. PRINCETON	STUDIES OF DUST CAKE FORMATION AND STRUCTURE IN FABRIC FILTRATION	MILLER, BERNARD	80492601	NEW	76/11/30	$65,517
** TRAINING **						
ASSOCIATION OF NEW JERSEY ENVRN. COMM. MORRISTOWN	TRAINING COURSE FOR LOCAL OFFICIALS RELATIVE TO LOCAL ACTION ON BEHALF OF PLANNING ELEMENTS OF PL925	ASHMUN, CANDACE M.	90057701	INCR	77/03/04	$42,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	NEW MEXICO					
** DEMONSTRATION **						
NEW MEXICO STATE UNIV LAS CRUCES	DEMONSTRATION OF IRRIGATION RETURN FLOW SALINITY CONTROL IN THE UPPER RIO GRANDE	CARRUTHERS, GARREY	80356503	CONT	77/02/23	$215,634

N E W Y O R K

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
CLARKSON COLLEGE OF TECH. POTSDAM	QUANTATIVE CHEMICAL ANALYSIS PARTICULATES RAMAN SPECTROSCOPY:THEORETICAL CONSIDERATION &COMPUTATIONS	KERKER, M.	80465901	INCR	77/02/16	$18,240
ENVIRONMENTAL CONSERV. RES., INC. ALBANY	AIR QUALITY ABOVE MORNING SURFACE INVERSION: EFFECT ON URBAN OZONE CONCENTRATIONS	STASIUK, WILLIAM N.	80331601	NEW	77/02/04	$42,900
INTERNATIONAL OZONE INST. SYRACUSE	OZONE/CHLORINE DIOXIDE OXIDATION PRODUCTS OF ORGANIC MATERIALS	RICE, R. G.	80499201	NEW	76/12/23	$10,200
NATIONAL COUNCIL OF PAPER IND. NEW YORK	MGMT STRATEGY DETECTION/RECOVERY INTERMITTENT PROCESS LOSSES/REDUCE VARIABILITY EFFLUENT LOADS	BLOSSER, RUSSELL O.	80408601	INCR	77/02/07	$75,000
NATIONAL COUNCIL OF PAPER INDUSTRY NEW YORK	INVESTIGATIONS OF HEAT TREATMENT AS METHOD OF SLUDGE CONDITIONING FOR REUSE OR IMPROVED DEWATERING	MARSHALL, DUANE W.	80334701	NEW	77/03/16	$29,546
NEW YORK DEPT. OF ENVRN. CONSERV. ALABNY	SULFATE & PARTICULATE EMISSIONS FROM IN-USE CATALYST VEHICLES	GIBBS, RICHARD E.	80352002	INCR	77/01/18	$80,000
NEW YORK STATE DEPT. ENVRN. CONSERV. ALBANY	RESEARCH ON AUTOMOBILE POLLUTION DISPERSION ("ROAD")	RAO, S. T.	80388101	INCR	77/02/02	$32,735
NEW YORK UNIV. NEW YORK	NOVEL PRETREATMENTS FOR WASTE CELLULOSE HYDROLYSIS FOR UTILIZATION CELLULOSE VALUES FROM SOLID WASTE	BRENNER, WALTER	80366401	INCR	76/12/21	$5,000
NEW YORK, UNIV. OF NEW YORK	REMOTE MONITORING OF AIR POLLUTION PRODUCED BY STATIONARY SOURCES, AREA SOURCES, AND PRESENT IN AMBI	AHMED, SAMIR A.	80310903	INCR	76/11/30	$19,704
RENSSELAER POLYTECHNIC INST. TROY	MODELING TRANSPORT & BEHAVIOR OF PESTICIDES & OTHER TOXIC ORGANIC MATERIALS IN AQUATIC ENVIRONMENTS	PARK, RICHARD A.	80482001	INCR	77/03/08	$11,255

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	N E W Y O R K					
** RESEARCH **						
RENSSELAER POLYTECHNIC INST, TROY	ADAPTATION OF AQUATIC ECOSYSTEM MODEL FOR APPLIED USES	PARK, R. L.	80504701	NEW	77/01/17	$60,450
SYRACUSE RES. CORP. SYRACUSE	ASSESSMENT OF MUTAGENIC/CARCINOGENIC POTENTIAL OF MIXTURES OF ORGANIC SUBSTANCES IN RENOVATED WATERS	SAXENA, JITENDRA	80481301	NEW	76/11/30	$59,652
** DEMONSTRATION **						
NEW YORK STATE DEPT OF ENVRN. CONSERV ALBANY	STEINMETZ LAKE RESTORATION PROJECT	BERLE, P. A.	80490701	NEW	76/12/30	$36,680
** TRAINING **						
CORNELL UNIV. ITHACA	FUTURE ISSUES AND EVENTS AFFECTING CONTINUING WATER QUALITY MANAGEMENT	LOUCKS, D.	90065001	NEW	76/12/23	$50,000
ULSTER CNTY. KINGSTON	PILOT MANPOWER DEVELOPMENT & TRAINING PROGRAM USING MULTIPLE FUNDING SOURCES	SAVAGO, P. J.	90064001	NEW	77/03/11	$11,000

N O R T H   C A R O L I N A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
DUKE UNIV. DURHAM	DEVELOP A TWO STAGE PARTICLE FRACTIONATOR BY FILTRDEVELOP A TWO STAGE PARTICLE FRACTIONATOR BY FILTR	BUZZARD, GALE H.	80301803	INCR	77/02/23	$12,000
DUKE UNIV. DURHAM	EVALUATION OF EMISSION OF NATURAL HYDROCARBONS FROM FOREST VEGETATION BY MICROMETEOROLOGICAL METHODS	KNOERR, KENNETH R.	80486001	INCR	76/11/24	$10,000
			80486001	INCR	77/01/26	$29,994
			ODS			
NORTH CAROLINA STATE UNIV. RALEIGH	ANALYSIS OF TOWER MEASUREMENTS OF TURBULENCE FOR NONUNIFORM FETCHES	WEBER, ALLEN H.	80427801	INCR	77/03/17	$1,700
NORTH CAROLINA, UNIV OF CHAPEL HILL	ASSESSMENT & CONTROL OF WW CONTAMINANTS ORIGINATING FROM PRODUCTION OF SYNTHETIC FUELS FROM COAL	SINGER, PHILIP	80491701	INCR	77/01/26	$82,580
NORTH CAROLINA, UNIV. OF CHAPEL HILL	OUTDOOR SIMULATION OF AIR POLLUTION CONTROL STRATEGIES	JEFFRIES, H. E.	80091605	CONT	77/02/02	$114,000
NORTH CAROLINA, UNIV. OF CHAPEL HILL	EXPERIMENTAL STUDY OF AEROSOL FORMATION IN CONTROLLED ATMOSPHERE	FOX, DONALD L.	80247203	INCR	76/12/21	$34,216
			80247203	INCR	77/01/26	$4,806
			80247203	INCR	77/03/16	$74,255
NORTH CAROLINA, UNIV. OF CHAPEL HILL	EVALUATE TENTATIVE STANDARD METHODS FOR ENTERIC VIRUS CONCENTRATION & DETECTION IN DRINKING WATER	SOBSEY, M. D.	80421802	CONT	76/12/07	$80,456

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
NORTH CAROLINA						
** RESEARCH **						
NORTH CAROLINA, UNIV. OF CHAPEL HILL	PHOTOCHEMICAL STUDY OF NOX REMOVAL FROM STACK GASES	FOX, DONALD L.	80474001	NEW	76/11/30	$38,551
** TRAINING **						
NATIONAL ASSOC. OF ATTORNEYS GENERAL RALEIGH	ENVRN. CONTROL SEMINARS FOR STATE ATTORNEYS GENERAL'S ENFORCEMENT STAFFS	WHEELER, P. G.	90064201	NEW	77/01/19	$20,000
NORTH CAROLINA, UNIV. OF CHARLOTTE CHARLOTTE	OPERATION & MAINTENANCE OF WASTEWATER COLLECTION SYSTEMS TRAINING PROGRAM	ELLIS, LEO, VICE CHANC	00422701	NEW	76/12/22	$9,700

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	O H I O					
** RESEARCH **						
CASE WESTERN RESERVE UNIV. CLEVELAND	DISPERSION AND FATE OF HAZARDOUS MATERIALS IN LARGE LAKES	LICK, W.	80370402	INCR	77/03/04	$84,972
CHRIST HOSPITAL INST. OF MEDICAL RES. CINCINNATI	UNIQUE APPROACHES TO PROPAGATION OF HAV IN CELL CULTURE & ANIMALS	SCHIFF, GILBERT M.	80514401	NEW	77/02/23	$95,725
CINCINNATI, UNIV. OF CINCINNATI	INVESTIGATION OF THE METABOLISM OF CHLORINATED HYROCARBONS IN SUBHUMAN PRIMATES	SMITH, C. C.	80396302	CONT	77/03/04	$132,644
CINCINNATI, UNIV. OF CINCINNATI	OCCURENCE & EFFECTS OF ORGANICS IN DRINKING WATER-MUTAGENIC & CARCINOGENIC EFFECTS OF ORGANICS IN DR	LOPER, J.	80420202	CONT	77/03/09	$174,214
CINCINNATI, UNIV. OF CINCINNATI	EFFECTS OF PARTICULATES ON DISINFECTION OF ENTEROVIRUSES IN WATER BY CHLORINE DIOXIDE	SCARPINO, PASQUALE V.	80441801	INCR	76/12/16	$2,300
CINCINNATI, UNIV. OF CINCINNATI	EFFECTS OF PARTICULATES ON DISINFECTION OF ENTEROVIRUSES IN WATER BY CHLORINE DIOXIDE	SCARPINO, PASQUALE V.	80441802	CONT	77/03/16	$90,000
OHIO STATE UNIV. COLUMBUS	KINETIC STUDY OF SIMULATED SO2, NOX, RH-POLLUTED ATMOSPHERES	CALVERT, JACK G.	80434802	CONT	76/12/21	$90,000
OHIO STATE UNIV. COLUMBUS	DISSOLVED OXYGEN MEASUREMENTS IN THE OHIO STREAMS DURING URBAN RUNOFF	STIEFEL, R.	80520101	NEW	77/03/09	$13,775
OHIO UNIV. ATHENS	AUTOMATED MEASUREMENTS OF THE INFRARED SPECTRA OF CHROMATOGRAPHICALLY SEPARATED MATERIALS	GRIFFITHS, P.	80433302	CONT	77/02/16	$13,831
** TRAINING **						
CASE WESTERN RESERVE UNIV. CLEVELAND	CHEMICAL & SYSTEMS ENGINEERING TRAINING FOR WATER QUALITY CONTROL & MGMT.	PROBER, RICHARD	90006704	CONT	76/11/04	$21,326

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
O K L A H O M A						
** RESEARCH **						
EAST CENTRAL OKLAHOMA STATE UNIV. ADA	DISSEMINATION OF INFORMATION CONCERNING ANIMAL PRODUCTION EFFECTS ON ENVRN. QUALITY	ROWE, M. L.	80515101	NEW	77/02/01	$42,110
** TRAINING **						
NATIONAL RURAL WATER ASSOC. DUNCAN	STATE RURAL WATER TRAINING AND TECHNICAL ASSISTANCE PROGRAMS	MONTGOMERY, J.	90064701	NEW	77/03/25	$798,900
OKLA STATE DEPT OF HEALTA OKLAHOMA CITY	OKLA STATE WASTEWATER OPERATOR MOBILE TRAINING PROJECT	WALTER D ATKINS ACTING	00613101	NEW	77/01/25	$9,000
UNITED STATES JAYCEES TULSA	NATION-WIDE CITIZEN-INITIATIVE, CLEAN WATER, EDUCATION TRAINING BY THE US JAYCEES	VARNADORE, D. G.	90063701	NEW	76/12/16	$92,140

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	O R E G O N					
** RESEARCH **						
OREGON DEPT. OF FISH AND WILDLIFE CORVALLIS	EFFECT OF METALS & HERBICIDES ON MIGRATION & SEAWATER ADAPTATION OF JUVENILE COHO SALMON	LORZ, H. W.	R80428302	CONT	76/12/16	$67,994
			R80428302	INCR	77/03/14	$16,880
OREGON STATE UNIV. CORVALLIS	ABSORPTION & DISTRIBUTION OF LOW LEVELS OF CADMIUM	BUHLER, DONALD R.	R80342302	INCR	76/12/07	$31,249
OREGON STATE UNIV. CORVALLIS	EFFECT OF NON-GASEOUS AIRBORNE POLLUTANTS FROM COAL-FIRED POWER PLANTS ON PLANT GROWTH & METABOLISM	LANDA, EDWARD R.	R80394802	CONT	76/11/30	$82,848
OREGON STATE UNIV. CORVALLIS	EFFECTS OF ENVRN. CONTAMINANTS ON CELL-MEDIATED IMMUNITY	KOLLER, L. D.	R80420002	CONT	77/02/02	$65,111
OREGON STATE UNIV. CORVALLIS	ABSORPTION CHARACTERISTICS OF PROLATE SPHEROIDAL MODEL OF MAN & ANIMALS AT & NEAR RESONANCE FREQUENC	TRIPATHI, VIJAI	R80469701	INCR	76/12/07	$1,060
OREGON STATE UNIV. CORVALLIS	PROCEDURES FOR QUANTITATIVE ECOLOGICAL ASSESSMENTS IN THE INTERTIDAL	GONOR, JEFFERSON	R80501801	NEW	76/12/16	$22,011
PORTLAND STATE UNIV. PORTLAND	INVESTIGATION OF REACTIONS OF AROMATIC HYDROCARBONS IN PHOTOCHEMICAL AIR POLLUTION	O'BRIEN, R. J.	R80476401	INCR	77/01/19	$30,000
** DEMONSTRATION **						
TUALATIN HILLS PARK & REC. DIST. BEAVERTON	COMMONWEALTH LAKE IMPROVEMENT PROJECT	BJORK, J. A.	R80475501	NEW	76/12/21	$53,200

P E N N S Y L V A N I A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
DREXEL UNIV. PHILADELPHIA	SPILL ALERT DEVICE FOR IMPOUNDED HAZARDOUS MATERIALS	KOENER, ROBERT	80251103	INCR	77/01/26	$15,000
DREXEL UNIV. PHILADELPHIA	MICROWAVE SYSTEM FOR LOCATING FAULTS IN HAZARDOUS MATERIAL DIKES: PARAMETER SPECIFICATION	KOERNER, R. M.	80476301	INCR	77/01/05	$25,000
PHILADELPHIA ACADEMY NATURAL SCIENCES PHILADELPHIA	GROWTHS OF CLADOPHORA GLOMERATA RELATIONSHIPS TO TRACE NUTRIENTS HERBIVORES & ECOSYSTEMS FUNCTIONING	PATRICK, R.	80510601	NEW	77/01/18	$124,991
THOMAS JEFFERSON UNIV. PHILADELPHIA	ORGANOPHOSPHATE INSECTICIDES ON BENZO(A) PYRENE CARCINOGENESIS	TRIOLO, A.	80348603	CONT	77/02/16	$45,000

R H O D E   I S L A N D

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
RAYTHEON CO. PORTSMOUTH	DEVELOPMENT OF DYNAMIC TWO-LAYER MODEL FOR STRATIFIED ESTUARIES	CHAMBERLAIN, S.	80517001	NEW	77/03/22	$47,407
RHODE ISLAND, UNIV. OF KINGSTON	DEVELOPMENT OF A METHOD FOR STABLIZING INDICATOR BACTERIA IN WATER SAMPLES	WOOD, N. P.	80396702	CONT	77/01/12	$15,166
RHODE ISLAND, UNIV. OF KINGSTON	DIFFUSION CHAMBER ARRAY FOR AQUATIC ENVIRONMENTAL EXPOSURE	SIEBURTH, J.	80488602	CONT	77/03/28	$25,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD

S O U T H   C A R O L I N A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
CLAFLIN COLLEGE ORANGEBURG	ARSENIC DETERMINATION BY SILVER DIETHYLDITHIOCARBAMAT E METHOD-ELIMINATION OF METAL ION INTERFERENCES	SANDHU, SHINGARA S.	80416401	INCR	77/03/08	$5,664
CLEMSON UNIV. CLEMSON	ENERGY CONSERV. THRU POINT SOURCE RECYCLE WITH HIGH TEMPERATURE HYPERFILTRATION	BISHOP, EUGENE	80387501	INCR	76/12/14	$84,953
CLEMSON UNIV. CLEMSON	DETERMINATION OF BREEDING SITES & EFFECTS OF NEMATODES IN MUN. DRINKING WATER TREATMENT FACILITY	TOMBES, A. S.	80429201	INCR	77/02/08	$52,356
SOUTH CAROLINA, UNIV. OF COLUMBIA	FOURIER TRANSFORM NMR OF METALS OF ENVIRONMENTAL SIGNIFICANCE	ELLIS, PAUL D.	80435902	CONT	77/03/14	$40,983
SOUTH CAROLINA, UNIV. OF COLUMBIA	THE DYNAMICS OF AN ESTUARY AS A NATURAL ECOSYSTEM	VERNBERG, F. JOHN	80440701	INCR	77/01/05	$5,422

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	S O U T H D A K O T A					
** RESEARCH **						
SOUTH DAKOTA STATE UNIV. BROOKINGS	INFILTRATION LAND TREATMENT OF STABILIZATION POND EFFLUENT	DORNBUSH, J.	80380402	CONT	77/03/23	$66,480
** DEMONSTRATION **						
VIBORG, CITY OF VIBORG	PROJECT FOR RESTORATION & PRESERVATION OF ENVRN. QUALITY AT SWAN LAKE	ANDERSON, A.	80496901	NEW	76/12/07	$39,500

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	TENNESSEE					
** RESEARCH **						
TENNESSEE, UNIV, OF KNOXVILLE	CHEMICAL RECLAMATION OF SCRAP RUBBER	LARSEN, JOHN W.	80432101	NEW	76/12/02	$88,275
VANDERBILT UNIV. NASHVILLE	WRITING BOOK ON TOXICOLOGY OF PESTICIDES	HAYES, W. J.	80488501	NEW	76/11/15	$67,255

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	T E X A S					
** RESEARCH **						
TEXAS, UNIV, OF AUSTIN	DEVELOPMENT & STANDARDIZATION OF INDENTIFICATION & MONITORING TECHNIQUES FOR BACULOVIRUS PESTICIDES	SUMMERS, M. D.	80366602	INCR	77/03/04	$10,490
TEXAS, UNIV, OF AUSTIN	REACTIONS OF SULFUR DIOXIDE IN AEROSOLS	HIMMELBLAU, D.	80381402	INCR	76/12/23	$30,000
** TRAINING **						
TEXAS A&M UNIVERSITY COLLEGE STATION	TX A&M UNIV, HANDLING AND DISPOSAL OF HAZARDOUS WASTE PRO	W.C. FREEMAN, JR, EXEC	00613201	NEW	77/03/14	$9,891

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	U T A H					
** TRAINING **						
UTAH STATE UNIV. LOGAN	INSTRUCTIONAL DEVELOPMENT WORKSHOPS	GEARHEART, ROBERT	90051801	NEW	77/01/12	$41,677

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
VERMONT						
** RESEARCH **						
VERMONT, UNIV, OF BURLINGTON	FEASIBILITY STUDY FOR AN ASBESTOS AEROSOL MONITOR	DETENBECK, ROBERT W.	80456201	INCR	76/12/23	$10,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
V I R G I N I A						
** RESEARCH **						
NORFOLK STATE COLLEGE NORFOLK	PHOTON CORRELATION IN LASER DOPPLER SPECTROSCOPY FOR PARTICLE SIZE MEASUREMENTS	ALEYAMMA, GEORGE	80376501	INCR	77/02/23	$19,000
OLD DOMINION UNIV. RES. FDN. NORFOLK	SULFUR DIOXIDE POLLUTION: REVIEW & ASSESSMENT OF FUTURE MEASUREMENT NEEDS FROM AIRBORNE LIDAR	OUSTERHOUT, D. S.	80501701	NEW	77/02/01	$13,801
VIRGINIA MEDICAL COLLEGE RICHMOND	EFFECTS OF SELECTED ORGANIC WATER CONTAMINANTS ON MALE REPRODUCTION FUNCTION	BORZELLECA, JOSEPH F.	80429002	CONT	76/12/30	$57,600
VIRGINIA MEDICAL COLLEGE RICHMOND	EXCRETION OF PESTICIDES IN SALIVA	BORZELLECA, J. F.	80431802	CONT	77/01/26	$53,072
VIRGINIA POLYTECHNIC INST. BLACKSBURG	WORKSHOP ON PUBLIC POLICY FOR GROUND WATER PROTECTION	KERNS, W.	80523601	NEW	77/03/17	$9,000
VIRGINIA, COMMONWEALTH OF RICHMOND	DEVELOP INCINERATOR OPERATING CONDITIONS NECESSARY FOR KEPONE CONTAMINATE SLUDGE DISPOSAL	BARTSCH, E. H.	80511201	NEW	77/02/01	$116,000
** DEMONSTRATION **						
RIVANNA WATER & SEWER AUTH. CHARLOTTESVILLE	RIVANNA RESERVIOR RESTORATION PROJECT	WILLIAMS, G. W.	80494901	NEW	77/03/23	$39,728
** TRAINING **						
NATIONAL RECREATION AND PARK ASSOC. ARLINGTON	INVOLVE PARK & RECREATION AGENCIES IN WATER POLLUTION CONTROL	VERHOVEN, PETER	90059001	INCR	77/01/26	$38,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	W A S H I N G T O N					
** RESEARCH **						
VIRGINIA MASON RES. CTR. SEATTLE	CONTINUOUS MONITORING OF DISSOLVED GAS PRESSURE	D'AOUST, BRIAN G.	80417501	INCR	76/11/01	$1,000
VIRGINIA MASON RESEARCH CTR. SEATTLE	CONTINUOUS MONITORONG OF TOTAL DISSOLVED GAS PRESSURE	D'AOUST, BRIAN G.	80417502	CONT	76/11/30	$25,250
WASHINGTON STATE UNIV. PULLMAN	CONTROL OF FERTILIZER NUTRIENT LOSSES IN IRRIGATED PORTIONS OF THE PACIFIC NORTHWEST	MCNEAL, B. L.	80503701	NEW	77/01/12	$63,458
WASHINGTON, UNIV. OF SEATTLE	OPTICAL EFFECTS OF ATMOSPHERIC AEROSOL	WAGGONER, A. P.	80066512	INCR	77/02/01	$25,000
WASHINGTON, UNIV. OF SEATTLE	FINE PARTICLE COLLECTION WITH UW ELECTROSTATIC SCRUBBER	PILAT, MICHAEL J.	80327801	NEW	77/03/14	$71,799
WASHINGTON, UNIV. OF SEATTLE	FINE PARTICLE CONTROL WITH UNIVERSITY OF WASHINGTON ELECTROSTATIC SCRUBBER	PILAT, MICHAEL J.	80439302	CONT	77/03/16	$115,265
** DEMONSTRATION **						
LIBERTY LAKE SEWER DIST. LIBERTY LAKE	LIBERTY LAKE REHABILITATION PROJECT	ASHLOCK, D. L.	80448701	NEW	77/02/07	$577,975
MEDICAL LAKE, TOWN OF MEDICAL LAKE	RESTORATION ANALYSIS & REHABILITATION OF MEDICAL LAKE	GILBRETH, F.	80472801	NEW	76/12/21	$52,320
** FELLOWSHIPS **						
WASHINGTON, UNIV. OF SEATTLE	M.S./CIVIL ENGR.	NOLAN, J. L.	91098201	NEW	76/11/23	$2,188

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
W E S T V I R G I N I A						
** RESEARCH **						
WEST VIRGINIA UNIV. MORGANTOWN	EFFECTS OF PESTICIDE INTERACTIONS UPON THE REPRODUCTIVE SYSTEM	THOMAS, J. A.	80357803	CONT	77/02/16	$38,505
** FELLOWSHIPS **						
WEST VIRGINIA COLLEGE GRADUATE STUDIES MORGANTOWN	M.S./ENVRN. ENGR.	BEANE, RICHARD A.	91073401	INCR	77/03/04	$600
			91073401	INCR	77/01/18	$963

W I S C O N S I N

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
WISCONSIN DEPT. OF NATURAL RESOURCES MADSION	EFFECTS OF DREDGING AND NUTRIENT INACTIVATION AT LILLY LAKE	BUNST, RUSSELL C.	80487501	NEW	77/03/01	$125,465
WISCONSIN DNR MADISON	MENOMONEE RIVER WATERSHED STUDY OF MAJOR & TRACE CONSTITUENTS	JOHN KONRAD SUPV.	00514201	INCR	76/11/04	$135,000
			00514201	INCR	77/02/02	$242,000
WISCONSIN, UNIV. OF MILWAUKEE	DETERMINATION OF ATMOSPHERIC PHOSPHORUS ADDITION TO LAKE MICHIGAN	BEETON, A. M.	80323602	INCR	77/01/11	$7,000
WISCONSIN, UNIV. OF MADISON	INFECTIV ITY & PATHOGENICITY OF ENTEROVIRUSES INGESTED WITH DRINKING WATER	CLIVER, D. O.	80398602	CONT	76/10/25	$56,972
WISCONSIN, UNIV. OF MADISON	HUMAN HEALTH HAZARDS OF VIRUSES IN DRINKING & RECREATIONAL WATERS	D'ALESSIO, D.	80416102	CONT	77/03/28	$111,872
WISCONSIN, UNIV. OF MADISON	ION EXCHANGE MEMBRANES APPLIED TO NEW METHODS OF SAMPLING, ENRICHMENT & SPECIATION IN WATER ANALYSIS	BLAEDEL, WALTER F.	80417902	CONT	76/11/23	$32,692
WISCONSIN, UNIV. OF MADISON	SOCIO-ECONOMIC IMPACT ON LAKE IMPROVEMENT PROJECTS AT MIRROR/SHADOW LAKES & WHITE CLAY LAKE	KLESSIG, L. L.	80480201	NEW	77/02/02	$179,924
** DEMONSTRATION **						
WISCONSIN DEPT NATURAL RESOURCES MADISON	LAKE HENRY PROTECTION & REHABILITATION PROJECT	EARL, A. S.	80476501	NEW	76/12/21	$180,000
** TRAINING **						
WISCONSIN, UNIV. OF MADISON	WATER RESOURCES MANAGEMENT CONFERENCE	STEPHENSON, D.	90062701	NEW	76/12/14	$4,200

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		W I S C O N S I N				
** TRAINING **						
WISCONSIN, UNIV. OF MADISON	TRAINING THRU A SERIES OF WORKSHOPS IN THE PLANNING OF COLLECTION & TREATMENT FACILITIES	QUIGLEY, J.	90064401	NEW	77/02/01	$80,422
** FELLOWSHIPS **						
WISCONSIN, UNIV. OF MADISON	M.S./AIR POLLUTION CONTROL	SAMSON, PERRY J.	91058601	INCR	76/11/15	$522

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	FOREIGN COUNTRIES CANADA					
** RESEARCH **						
B.C. RESEARCH VANCOUVER	DEVELOPMENT OF A CHEMICAL TOXICITY ASSAY FOR PULP MILL EFFLUENTS	LEACH, J. M.	80497701	NEW	77/02/08	$83,400
WATERLOO, UNIV. OF ONTARIO	REMOVAL AND RECOVERY OF METALS AND PHOSPHATES FROM MUN. SEWAGE SLUDGE	SCOTT, D. S.	80466901	NEW	77/01/12	$23,600

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	FOREIGN COUNTRIES ISRAEL					
** RESEARCH **						
HEBREW UNIV, JERUSALEM	DEVELOPMENT OF METHODS FOR DETECTION & INACTIVATION OF VIRUSES IN VARIOUS WATERS	SHUVAL, H. I.	80351002	INCR	76/11/30	$49,616

APPLICANT MUNICIPALITY ,	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	FOREIGN COUNTRIES SWITZERLAND					
** RESEARCH **						
WORLD HEALTH ORGANIZATION GENEVA	EFFECTS OF LONG TERM EXPOSURE TO DDT	COPPLESTONE, J. F.	80505501	NEW	76/12/16	$16,700

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	FOREIGN COUNTRIES YUGOSLAVIA					
** RESEARCH **						
INSTITUTE FOR MEDICAL RES. ZAGRES	EFFECT OF ENVRN. POLLUTANTS IN RELATION TO AGE & DIETARY INFLUENCE: 1. TOXIC TRACE ELEMENTS	KOSTIAL, K.	80464101	NEW	77/02/02	$85,000

GRANT NUMBER	STATE	PROGRAM	APPLICANT
800649-180	CA	RESEARCH	CALIFORNIA, UNIV. OF
800665-121	WA	RESEARCH	WASHINGTON, UNIV. OF
800916-050	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
802472-031	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
802472-033	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
802472-032	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
802511-032	PA	RESEARCH	DREXEL UNIV.
802913-031	FL	RESEARCH	FLORIDA STATE UNIV.
802914-032	MN	RESEARCH	MINNESOTA, UNIV. OF
803018-031	NC	RESEARCH	DUKE UNIV.
803054-010	IL	RESEARCH	INTERNATIONAL CONGRESS OR RADIATION RE
803109-031	NY	RESEARCH	NEW YORK, UNIV. OF
803238-022	WI	RESEARCH	WISCONSIN, UNIV. OF
803278-010	WA	RESEARCH	WASHINGTON, UNIV. OF
803316-010	NY	RESEARCH	ENVIRONMENTAL CONSERV. RES., INC.
803338-012	LA	DEMONSTRATION	AMERICAN SHRIMP CANNERS ASSOC.
803347-010	NY	RESEARCH	NATIONAL COUNCIL OF PAPER INDUSTRY
803396-013	CA	DEMONSTRATION	MOUNTAIN VIEW, CITY OF
803399-030	MI	RESEARCH	MICHIGAN, UNIV. OF
803423-021	OR	RESEARCH	OREGON STATE UNIV.
803458-021	MS	RESEARCH	MISSISSIPPI STATE UNIV.
803458-030	MS	RESEARCH	MISSISSIPPI STATE UNIV.
803458-031	MS	RESEARCH	MISSISSIPPI STATE UNIV.
803467-010	MI	RESEARCH	COATING CONSULTANT
803486-030	PA	RESEARCH	THOMAS JEFFERSON UNIV.
803510-021	FC	RESEARCH	HEBREW UNIV.
803520-023	NY	RESEARCH	NEW YORK DEPT. OF ENVRN. CONSERV.
803565-030	NM	DEMONSTRATION	NEW MEXICO STATE UNIV
803578-030	WV	RESEARCH	WEST VIRGINIA UNIV.
803627-012	CT	DEMONSTRATION	ENFIELD, TOWN OF
803652-021	IL	RESEARCH	ILLINOIS, UNIV. OF
803652-020	IL	RESEARCH	ILLINOIS, UNIV. OF
803664-012	NY	RESEARCH	NEW YORK UNIV.
803666-021	TX	RESEARCH	TEXAS, UNIV. OF
803704-021	OH	RESEARCH	CASE WESTERN RESERVE UNIV.
803754-020	MI	RESEARCH	MICHIGAN, UNIV. OF
803765-011	VA	RESEARCH	NORFOLK STATE COLLEGE
803786-012	FL	RESEARCH	FLORIDA A&M UNIV.
803788-021	CO	RESEARCH	COLORADO STATE UNIV.
803791-015	CA	RESEARCH	CALIFORNIA, UNIV. OF
803798-020	CA	RESEARCH	CALIFORNIA, UNIV. OF
803802-021	CA	RESEARCH	STANFORD RES. INST.
803804-020	SD	RESEARCH	SOUTH DAKOTA STATE UNIV.
803814-021	TX	RESEARCH	TEXAS, UNIV. OF
803833-020	MA	RESEARCH	BOSTON UNIV.
803851-022	MN	RESEARCH	MINNESOTA, UNIV. OF
803859-030	MI	RESEARCH	MICHIGAN STATE UNIV.
803875-015	SC	RESEARCH	CLEMSON UNIV.
803881-012	NY	RESEARCH	NEW YORK STATE DEPT. ENVRN. CONSERV.
803885-020	CA	RESEARCH	SCRIPPS CLINIC & RES. FDN.
803887-020	FL	RESEARCH	FLORIDA STATE UNIV.
803896-017	MO	RESEARCH	WASHINGTON UNIV

GRANT NUMBER	STATE	PROGRAM	APPLICANT
803896-018	MO	RESEARCH	WASHINGTON UNIV.
803903-020	IA	RESEARCH	AMES, CITY OF
803915-012	IL	RESEARCH	DEPAUL UNIV.
803933-010	AL	RESEARCH	ALABAMA A&M UNIV.
803948-020	OR	RESEARCH	OREGON STATE UNIV.
803963-020	OH	RESEARCH	CINCINNATI, UNIV. OF
803967-020	RI	RESEARCH	RHODE ISLAND, UNIV. OF
803968-020	CO	RESEARCH	COLORADO, UNIV. OF
803978-012	NJ	RESEARCH	RUTGER STATE UNIV.
803983-020	HI	RESEARCH	HAWAII, UNIV. OF
803986-020	WI	RESEARCH	WISCONSIN, UNIV. OF
804086-012	NY	RESEARCH	NATIONAL COUNCIL OF PAPER IND.
804123-021	MA	RESEARCH	MASSACHUSETTS INST. OF TECH.
804155-020	GA	RESEARCH	GEORGIA, UNIV. OF
804161-020	WI	RESEARCH	WISCONSIN, UNIV. OF
804164-011	SC	RESEARCH	CLAFLIN COLLEGE
804175-011	WA	RESEARCH	VIRGINIA MASON RES. CTR.
804175-020	WA	RESEARCH	VIRGINIA MASON RESEARCH CTR.
804179-020	WI	RESEARCH	WISCONSIN, UNIV. OF
804200-020	OR	RESEARCH	OREGON STATE UNIV.
804202-020	OH	RESEARCH	CINCINNATI, UNIV. OF
804218-020	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804259-011	CA	RESEARCH	CALIFORNIA, UNIV. OF
804278-011	NC	RESEARCH	NORTH CAROLINA STATE UNIV.
804283-022	OR	RESEARCH	OREGON DEPT. OF FISH AND WILDLIFE
804283-020	OR	RESEARCH	OREGON DEPT. OF FISH AND WILDLIFE
804290-020	VA	RESEARCH	VIRGINIA MEDICAL COLLEGE
804291-020	MN	RESEARCH	MINNESOTA, UNIV. OF
804292-011	SC	RESEARCH	CLEMSON UNIV.
804311-011	NJ	RESEARCH	AMERICAN ELECTROPLATERS' SOCIETY
804318-020	VA	RESEARCH	VIRGINIA MEDICAL COLLEGE
804321-010	TN	RESEARCH	TENNESSEE, UNIV. OF
804333-020	OH	RESEARCH	OHIO UNIV.
804345-020	CA	RESEARCH	CALIFORNIA, UNIV. OF
804348-020	OH	RESEARCH	OHIO STATE UNIV.
804350-012	MA	DEMONSTRATION	W. R. GRACE AND CO.
804351-020	AZ	RESEARCH	ARIZONA, UNIV. OF
804353-020	FL	RESEARCH	MIAMI, UNIV. OF
804359-020	SC	RESEARCH	SOUTH CAROLINA, UNIV. OF
804360-013	DC	DEMONSTRATION	INTERNATIONAL CITY MANAGEMENT ASSOC.
804393-020	WA	RESEARCH	WASHINGTON, UNIV. OF
804403-020	IL	RESEARCH	ILLINOIS, UNIV. OF
804407-012	SC	RESEARCH	SOUTH CAROLINA, UNIV. OF
804418-011	OH	RESEARCH	CINCINNATI, UNIV. OF
804418-020	OH	RESEARCH	CINCINNATI, UNIV. OF
804455-011	NJ	RESEARCH	NEW JERSEY INST. OF TECH.
804487-010	WA	DEMONSTRATION	LIBERTY LAKE SEWER DIST.
804536-013	DC	RESEARCH	SMITHSONIAN INST.
804562-012	VT	RESEARCH	VERMONT, UNIV. OF
804603-010	CA	RESEARCH	LOMA LINDA UNIV.
804607-011	MI	RESEARCH	MICHIGAN, UNIV. OF
804641-010	FC	RESEARCH	INSTITUTE FOR MEDICAL RES.

GRANT NUMBER	STATE	PROGRAM	APPLICANT
804642-013	CA	RESEARCH	STANFORD RES. INST.
804659-011	NY	RESEARCH	CLARKSON COLLEGE OF TECH.
804669-010	FC	RESEARCH	WATERLOO, UNIV. OF
804690-010	MN	DEMONSTRATION	RAMSEY CNTY.
804695-012	IN	DEMONSTRATION	NOBLE CNTY. SOIL & WATER CONSERV. DIST
804697-011	OR	RESEARCH	OREGON STATE UNIV.
804712-010	MN	DEMONSTRATION	BLOOMINGTON, CITY OF
804728-010	WA	DEMONSTRATION	MEDICAL LAKE, TOWN OF
804730-010	MN	DEMONSTRATION	RICE CREEK WATERSHED DIST.
804740-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804755-010	OR	DEMONSTRATION	TUALATIN HILLS PARK & REC. DIST.
804763-011	PA	RESEARCH	DREXEL UNIV.
804764-011	OR	RESEARCH	PORTLAND STATE UNIV.
804765-010	WI	DEMONSTRATION	WISCONSIN DEPT NATURAL RESOURCES
804791-012	IL	DEMONSTRATION	SPRINGFIELD, CITY OF
804802-010	WI	RESEARCH	WISCONSIN, UNIV. OF
804803-010	MD	RESEARCH	MARYLAND, UNIV. OF
804804-011	ME	RESEARCH	MAINE MUN. ASSOC.
804813-010	NY	RESEARCH	SYRACUSE RES. CORP.
804820-012	NY	RESEARCH	RENSSELAER POLYTECHNIC INST.
804834-010	MI	RESEARCH	MICHIGAN, UNIV. OF
804836-010	NJ	RESEARCH	PRINCETON UNIV.
804853-010	CA	RESEARCH	CALIFORNIA, UNIV. OF
804854-011	NJ	RESEARCH	EDGEWATER, BORO OF
804860-012	NC	RESEARCH	DUKE UNIV.
804860-011	NC	RESEARCH	DUKE UNIV.
804875-010	WI	RESEARCH	WISCONSIN DEPT. OF NATURAL RESOURCES
804883-010	CA	RESEARCH	STANFORD UNIV.
804885-010	TN	RESEARCH	VANDERBILT UNIV.
804886-020	RI	RESEARCH	RHODE ISLAND, UNIV. OF
804895-010	CA	DEMONSTRATION	EAST BAY MUN. UTILITY DIST.
804897-010	CA	DEMONSTRATION	EAST B[illegible]EGIONAL PARK DIST.
804907-010	NY	DEMONSTRATION	NEW YO[illegible]ATE DEPT OF ENVRN. CONSERV
804912-010	IA	DEMONSTRATION	OELWE[illegible]TY OF
804916-010	FL	RESEARCH	FLO[illegible]STATE UNIV.
804917-012	NC	RESEARCH	NOR[illegible]AROLINA, UNIV OF
804926-010	NJ	RESEARCH	TEXTILE RESEARCH INST.
804949-010	VA	DEMONSTRATION	RIVANNA WATER & SEWER AUTH.
804956-010	MD	RESEARCH	CHESAPEAKE COLLEGE
804961-010	IA	DEMONSTRATION	LENOX MUN. WATERWORKS
804962-010	IL	DEMONSTRATION	ILLINOIS, STATE OF
804964-011	CA	RESEARCH	SAN JOSE STATE UNIV. FDN.
804965-011	AK	RESEARCH	ALASKA, UNIV. OF
804969-010	SD	DEMONSTRATION	VIBORG, CITY OF
804972-010	KY	RESEARCH	INTERSTATE MINING COMPACT COMM.
804973-010	MI	RESEARCH	MICHIGAN, UNIV. OF
804977-010	FC	RESEARCH	B.C. RESEARCH
804992-010	NY	RESEARCH	INTERNATIONAL OZONE INST.
805001-010	MA	DEMONSTRATION	BROCKTON, CITY OF
805003-013	IL	RESEARCH	ILLINOIS, UNIV. OF
805006-010	MO	RESEARCH	ST. LOUIS UNIV.
805012-010	MT	RESEARCH	HELENA DEPT. HEALTH & ENVRN. SCIENCES

GRANT NUMBER	STATE	PROGRAM	APPLICANT
805015-010	AL	RESEARCH	AUBURN UNIV.
805017-010	VA	RESEARCH	OLD DOMINION UNIV. RES. FDN.
805018-010	OR	RESEARCH	OREGON STATE UNIV.
805020-010	KS	RESEARCH	ASSOCIATION OF SYSTEMATICS COLLECTIONS
805023-010	MI	RESEARCH	NATIONAL SAN. FDN.
805037-010	WA	RESEARCH	WASHINGTON STATE UNIV.
805039-010	MO	RESEARCH	MISSOURI, UNIV. OF
805043-010	MO	RESEARCH	WASHINGTON UNIV.
805045-010	NV	RESEARCH	NEVADA, UNIV. OF
805047-010	NY	RESEARCH	RENSSELAER POLYTECHNIC INST.
805049-010	IL	RESEARCH	IIT RESEARCH INST.
805052-010	CA	RESEARCH	CALIFORNIA, UNIV. OF
805055-010	FC	RESEARCH	WORLD HEALTH ORGANIZATION
805066-010	LA	RESEARCH	TULANE UNIV.
805067-010	DC	RESEARCH	NATIONAL ACADEMY OF SCIENCE
805070-010	IN	RESEARCH	PURDUE RES. FDN.
805090-010	NJ	RESEARCH	RUTGERS STATE UNIV.
805091-010	MA	RESEARCH	HARVARD UNIV.
805102-010	DE	RESEARCH	DELAWARE, UNIV. OF
805106-010	PA	RESEARCH	PHILADELPHIA ACADEMY NATURAL SCIENCES
805112-010	VA	RESEARCH	VIRGINIA, COMMONWEALTH OF
805125-010	MI	RESEARCH	MICHIGAN, UNIV. OF
805126-010	MN	RESEARCH	MINNESOTA, UNIV. OF
805128-010	AL	RESEARCH	AUBURN UNIV/ALABAMA TEXTILE EDUC PROG.
805131-010	CO	RESEARCH	COLORADO STATE UNIV.
805133-010	MI	RESEARCH	MICHIGAN, UNIV. OF
805141-010	IL	RESEARCH	IIT RES. INST.
805144-010	OH	RESEARCH	CHRIST HOSPITAL INST. OF MEDICAL RES.
805146-010	MI	RESEARCH	MICHIGAN, UNIV. OF
805148-010	IN	RESEARCH	NOTRE DAME, UNIV. OF
805151-010	OK	RESEARCH	EAST CENTRAL OKLAHOMA STATE UNIV.
805170-010	RI	RESEARCH	RAYTHEON CO.
805197-010	GA	RESEARCH	GEORGIA, UNIV. OF
805201-010	OH	RESEARCH	OHIO STATE UNIV.
805202-010	IN	RESEARCH	NOTRE DAME, UNIV. OF
805236-010	VA	RESEARCH	VIRGINIA POLYTECHNIC INST.
805250-010	DC	RESEARCH	NATIONAL ACADEMY OF SCIENCES
900067-040	OH	TRAINING	CASE WESTERN RESERVE UNIV.
900518-010	UT	TRAINING	UTAH STATE UNIV.
900541-012	IA	TRAINING	ASSOCIATION OF BOARDS OF CERTIFICATION
900570-011	DC	TRAINING	NATIONAL ASSOC. OF. CNTY.
900574-011	DC	TRAINING	NATIONAL ASSOC OF CONSERV DISTRICTS
900577-011	NJ	TRAINING	ASSOCIATION OF NEW JERSEY ENVRN. COMM.
900590-012	VA	TRAINING	NATIONAL RECREATION AND PARK ASSOC.
900614-013	MD	TRAINING	CHARLES CNTY. COMMUN. COLLEGE
900614-012	MD	TRAINING	CHARLES CNTY. COMM. COLLEGE
900627-010	WI	TRAINING	WISCONSIN, UNIV. OF
900629-010	DC	TRAINING	CONSERVATION FDN.INC.
900633-010	DC	TRAINING	NATIONAL WILDLIFE FEDERATION
900637-010	OK	TRAINING	UNITED STATES JAYCEES
900640-010	NY	TRAINING	ULSTER CNTY.
900641-010	DC	TRAINING	NATIONAL WILDLIFE FED.

GRANT NUMBER	STATE	PROGRAM	APPLICANT
900642-010	NC	TRAINING	NATIONAL ASSOC, OF ATTORNEYS GENERAL
900643-010	DC	TRAINING	URBAN ENVRN, CONFERENCE, INC.
900644-010	WI	TRAINING	WISCONSIN, UNIV. OF
900647-010	OK	TRAINING	NATIONAL RURAL WATER ASSOC.
900649-010	MA	TRAINING	MASSACHUSETTS INST. OF TECH.
900650-010	NY	TRAINING	CORNELL UNIV.
900651-010	DC	TRAINING	INTERNATIONAL INST FOR ENVRN & DEVELOP
900653-010	DC	TRAINING	URBAN LAND INST.
900657-010	DC	TRAINING	NATIONAL ASSOC. OF COUNTIES RES. FDN.
910521-011	MN	FELLOWSHIPS	MINNESOTA, UNIV. OF
910550-012	MN	FELLOWSHIPS	MINNESOTA, UNIV. OF
910561-011	MN	FELLOWSHIPS	MINNESOTA, UNIV. OF
910562-011	MN	FELLOWSHIPS	MINNESOTA, UNIV. OF
910586-012	WI	FELLOWSHIPS	WISCONSIN, UNIV. OF
910734-013	WV	FELLOWSHIPS	WEST VIRGINIA COLLEGE GRADUATE STUDIES
910734-012	WV	FELLOWSHIPS	WEST VIRGINIA COLLEGE OF GRAD. STUDIES
910982-010	WA	FELLOWSHIPS	WASHINGTON, UNIV. OF
910989-010	MN	FELLOWSHIPS	MINNESOTA, UNIV. OF

R800649

Reactions of possible importance in photochemical air pollution are being investigated with a variety of techniques over a wide range of pressures and concentrations in homogeneous and heterogeneous vapor, liquid and solid systems. Research includes selected aspects of the photochemistry, spectroscopy, kinetics and mechanisms of photooxidation of common atmospheric pollutants, including PAN, oxides of nitrogen, monocyclic aromatic hydrocarbons, partially oxygenated hydrocarbons such as aldehydes and ketones, alkylating agents including epoxides, hydroperoxides and lactones, and polycyclic organic hydrocarbons. Long path (20-40 m) ir and uv techniques are used to identify unstable intermediates and products in the ppm range. Chemiluminescent reactions of ozone with olefins and organic sulfides are being investigated to determine emission intensities and the nature of the reaction processes. Applications of this phenomenon to improved air pollution monitoring instrumentation are being studied.

The *o*-nitrobenzaldehyde chemical actinometer originally developed on this project has been field tested by federal and state agencies and continues to be evaluated and improved.

Information derived from laboratory studies cited above is being applied to the design and execution of cooperative smog chamber studies of synthetic and real atmospheres. It is also being used to derive more accurate hydrocarbon and oxygenated hydrocarbon reactivity scales useful in consideration of exhaust control devices and fuel modifications.

R800665

Air pollution, or more specifically, the suspended particulate matter or aerosol, has dramatic effects on the optical properties of air. Visibility is often degraded from tens or hundreds of kilometers down to a few kilometers by the urban atmospheric aerosol. The properties of this aerosol in both urban and rural areas is determined by the balance between sources, transport and removal mechanisms for particles and the surrounding air. The molecular nature and size of each individual particle; 1) is a function of source, sink and transformation mechanisms, 2) determines in part the particle residence time and transport distance in the atmosphere, 3) controls the particle response to changes in temperature and/or relative humidity, 4) determines each particle contribution to integral aerosol effect such as visibility reduction or human health impairment. The proposed research will include analysis of existing and future data, field experiments, laboratory experiments to verify existing techniques and the development of new methods as needed to describe the physical and chemical nature of the aerosol as related to sources, transport and effects. This type of description of the aerosol and its effects is necessary for a rational attack on the visibility problem even on such basic levels as assessing the degree of visibility reduction due to man, and choosing the physical scale that must be considered in describing the system.

R800915

It has been the belief of our Research Group that an understanding of the smog precursors and its control can be most effectively achieved by the integrated use of smog chamber data, photochemical modeling and aerometric measurements. We have discovered that direct and simple application of current smog chamber data to real atmospheric conditions is difficult at best. This is because 1) oxidant yields in chambers are strongly dependent on wall characteristics, nitrogen-aldehydes chemistry, chamber light intensities and experimental temperatures and 2) the dynamic processes of injection, dilution and mixing in real atmospheres are not well represented by just irradiating morning urban concentrations in a smog chamber. It is our hope that current and continued refinements in our photochemical model will make it possible to better quantify the most important regions of hydrocarbon NO_x-oxidant control strategy diagrams. Some of the major improvements in the model will come from the results of our proposed smog experiments which will isolate the influence of nitric and nitrous acid, aldehyde, PAN, carbon monoxide, aromatics and less reactive hydrocarbon materials on smog systems. Since most of this work will be done on static smog chamber systems, continued effort will be made to simulate real atmospheric smog conditions by using sophisticated patterns of continued injection and dilution in the chamber. Simultaneously, static analog experiments will be conducted with these very complex experiments. This information will then be used to reconstruct modeling results so that the derived control strategy relationships will have implicit atmospheric relevance.

R802472

Objectives of this project during the third budget period.

This program has designed and built an outdoor chamber facility for the investigation of aerosol formation processes similar to those occurring in the ambient atmosphere. During the second budget period, experimental methods and procedures were developed or adapted for this project and an experimental program is now in progress. The overall objectives of this budget period will be to investigate gas to particle conversion processes. This will be accomplished by conducting chamber experiments in three areas: sulfate aerosol formation in hydrocarbon-NO_x systems, SO_2-NO_x plume systems and systems containing metallic seed nuclei. During this coming period, additional experiments will be conducted on this system. Aerosol parameters to be obtained include condensation nuclei count, size distributions by electric aerosol analyzer and filter samples for sulfate analysis by x-ray fluorescence and flash vaporization flame photometric detection.

The hydrocarbon-NO_x-SO_2 system is an analog of aerosol formation in urban areas with multiple sources of pollution, stationary and mobile. The second area of research involves the SO_2-NO_x system as an analog of the processes occurring in a power plant plume. A series of experiments with various initial concentrations of SO_2, NO, NO_2 and water vapor will be conducted.

The third major area of research will be generation of aerosols in the presence of seed nuclei. Existing aerosols provide an alternate oxidation process for conversion of SO_2 to sulfate. Metallic nuclei will be introduced into the chamber and the size distribution will be determined, then SO_2 will be introduced and evolution of the aerosol will be measured.

R802511

Devices to provide early warning of potential spills of impounded hazardous materials will be developed and demonstrated. The technique to be used is based upon the detection of stress waves (acoustic emissions) that are generated by the interparticle movement of the earthen dike material as it reacts to accomodate the applied stress imposed by the pressure of the stored hazardous materials. The acoustic emissions are most intense during change in stress loading but also continue during the periods of relaxation (accomodation and particle rearrangement) that follow stress application. The behavior (amplitude, frequency and attenuation, etc.) of such stress waves has been correlated with stress level for many types of soils used to construct earthen dams.

The project is divided into two consecutive phases, the first of which includes laboratory studies on soil samples and preliminary field testing on actual earthen dikes. The second phase continues the laboratory work and expands the field testing to a number of dikes over a long time period. The product of this project will be a report and a portable, easy-to-use, early warning device to identify prone-to-failure dikes, or sections thereof, and thereby to warn of potential hazardous material spill situations.

R802913

The nuclear technique of proton scattering will be developed into a broad range quantitative analysis method for air particulate matter for all elements up to potassium. Data acquisition and data evaluation times as short as 5 minutes are an objective. Proton scattering spectra and cross sections have been determined using 16 MeV protons from a Tandem Van de Graaff accelerator. A computer program is being developed to utilize it to quantitatively analyze the elemental content of air particulate samples.

R802914

Purpose of study is to determine basis for stream standards for cyanide relating to fishes and invertebrates. Further objectives are to determine effects of temperature, oxygen levels, and other pollutants on fish sensitivity. Proposed work for the final segment of the cyanide study will include: (a) completion of temperature bioassay series to determine effects on sensitivity of two fish species; (b) chronic tests on bluegills and brook trout to determine success of spawning and growth; (c) acute and chronic bioassay of cyanide combined with zinc, ammonia, and phenol; (d) determination of photodecomposition of ferrocyanide; (e) chronic bioassays will be done on two invertebrates. All work is in flow-through type apparatus using laboratory water.

R803018

"Development of a Two Stage Particle Fractionator by Filtration Through Nuclepore Surfaces" The objective of this grant proposal is to develop an ultra-low cost dichotomous sampler for collection of fine and coarse particles on two separate filters which can be analyzed by x-ray fluorescence.

R803054

The Congress is the fifth in an international series that began in Burlington, Vermont, in 1958 and has continued at Harrogate (England), Cortina (Italy), and Evian (France). The Congress is interdisciplinary in nature and encompasses the physical, chemical, biological, and medical aspects of radiation research. While the focus is on fundamental research in these areas, emphasis is also placed on research in radiotherapy, power generation, and the environment.

R803109

1. Objectives: Design and optimize the single-ended dye laser lidar system for operation in a simultaneous two-wavelength output mode to measure accurately SO_2 and O_3 atmospheric pollutant concentrations. The conclusion of the planned program will provide the hard design data for a practical lidar system which can be used for monitoring NO_2, SO_2 and O_3 concentrations produced by stationary sources and present in ambient conditions. 2. Approach: Experiments will be carried out to determine the most effective system parameters for frequency doubling in conjunction with the simultaneous two-wavelength operation. Two different approaches using single crystals will be examined. The techniques developed for simultaneous two-wavelength operation for NO_2 measurements will be extended to SO_2 and O_3. 3. Progress thus far in the second year has resulted in field measurements for NO_2 using the simultaneous mode of operation, which clearly demonstrated its advantages in terms of increased accuracy and elimination of errors due to temporal changes. The field tests detected ambient NO_2 concentrations at ranges of 5 kilometers. Using the frequency doubled laser output, preliminary field tests for SO_2 measurements were also carried out at ranges of approximately 1 kilometer.

R803238

"Determination of Atmospheric Phosphorus Addition to Lake Michigan"
The overall objective of this project is to determine the contribution of atmospheric phosphorus to the nutrient budget of Lake Michigan. This will be accomplished by determining the phosphorus level of monthly-integrated precipitation samples.

R803278

Objectives

The objectives of the proposed research are to demonstrate the effectiveness of the UW Electrostatic Scrubber for controlling the emissions of fine particles from coal-fired power plants.

Approach

The research approach includes constructing a 1,000 acfm pilot plant electrostatic scrubber in a 40 ft. trailer. The pilot plant in the trailer will be transported to coal-fired power plants where tests will be conducted concerning the efficiency of collection the particulate air pollutants from the exhaust gases.

Current Progress

Tests have been conducted on 140 and 1,000 acfm electrostatic scrubber pilot plants using DOP aerosols. The system has shown very good collection efficiencies for even the fine particles.

R803316

The overall goal of the program, of which this study is a part, is to assess the effect of background ozone on urban ozone concentrations. In this study air quality parameters will be monitored at or near the top of a skyscraper in New York City. Urban air is trapped by the surface inversion which forms through the evening hours and persists into early morning. The site will often be above this inversion layer and the data collected will be indicative of the quality of the air which will mix with the trapped air as the inversion is destroyed. Of special interest are the levels of ozone and ozone precursors in this upper air. The effect of these on the urban ozone levels will be assessed. Data collected at the site will include ozone, nitric oxide, nitrogen dioxide, methane, total hydrocarbons, carbon monoxide, condensation nuclei, dewpoint and temperature. Concurrent studies will be providing data about the surface air quality within the urban area as well as at background stations.

S803338

"Shrimp Cannery Wastewate Treatment Demonstration Project"
An inplant water conservation and management program will be instituted along with several possible process midifications. The resulting effluent will be treated (plant scale) by screening and dissolved-air flotation with chemical addition. Screening and sludge will be processed for ultimate disposal.

R803347

The project has two objectives. The first is to determine the suitability of the ash fraction of reclaimed deinking sludge after destructive heat treatment (wet oxidation), as a filler material in paper manufactured on a model paper machine at Western Michigan University. When high grade printed papers are deinked in the process of their preparation for recycle approximately 20 to 40% of the recycled paper weight is accounted for by inert filler materials consisting of clay and titanium dioxide These inert filler materials account for as much as 60 to 80% of the sludge resulting from the treatment of deinking process effluents. Being impregnated with ink, the filler materials are not suitable for direct reuse in paper making and conventional incineration alters the chemical composition resulting in a product with extreme abrassive properties. Laboratory studies indicate wet oxidation produces a material satisfactory for reuse in paper making, therefore, offering an alternative to serious land disposal problems for waste treatment sludge from this process.

Non-destructive heat treatment has been shown to be an effective means of sludge conditioning to permit mechanical dewatering. The second objective of this project is to examine in the laboratory the benefits of heat treatment on sludge dewaterability of hydrous sludges consisting principally of groundwood fines, those from chemically coagulated effluents from biological treatment and those from chemical-physical treatment of process water. All are charactistically extremely difficult to mechanically dewater, a necessary process in several forms of ultimate disposal. It is likely that th optimum form of conditioning may be a combination of chemical and heat treatment. This will also be investigated in the laboratory.

S803396

"Shoreline Regional Park Gas Recovery Project"
Raw landfill gas will be recovered from the City of Mountain View disposal site and then upgraded for use by Pacific Gas and Electric Company's gas transmission line for distribution.

R803399

The objective of the study is to evaluate long path laser monitoring of ambient level air pollution. The lasers which have been considered are semi-conductor diode and sequentially step tuned carbon dioxide types. Systems employing both types were tested during the summer of 1974 in St. Louis in connection with the Regional Air Pollution Study (RAPS). The diode laser system was tested in St. Louis during 1975 and will be tested again in 1976.

It is expected that the diode laser system will be used in St. Louis during 1976 for pollutant variability.

A step tuned laser system will be tested in Syracuse, New York and demonstrated to various Environmental Protection Agency groups in the spring of 1977.

R803423

"Absorption and Distribution of Low Levels of Cadmium. A Comparison Between Water and Food"

The bioavailability of cadmium from drinking water will becompared with that from food. The influence of hard water constituents upon the systemic absorption of cadium will also be studied.

R803458

Preparation procedures of BSA-Kelevan have been perfected, and samples prepared for use as antigen for rabbit immunization. A preparation high in content of covalently linked Kelevan was used for production of a highly active antibody toward fibrinogen-Kel.

The Kelevan active antibody preparation was used in biochemical studies of ATPase inhibition and reactivation using fire ant head and dog brain homogenate fractions. Preliminary results are very promising and show quite definitely that Kepone and DCPD inhibition of ATPase activities is reversible.

The kinetics of the reactivation process will be determined, including the mole capacity of the Ig fraction for Kepone and DCPD. Studies will be conducted to determine the relative affinity of the Ig fraction for Kepone compared to the affinity of purified ATPase for Kepone. The reactivation of Kepone inhibited ATPase activities will be compared for different tissues from a single animal and for the same tissue from different animals. Finally efforts will be initiated to covalently attach antibody to a solid support system.

R803467

"Metal Finishing: Painting Waste Load Study"
A state-of-the-art survey will be conducted on the liquid, solid and gaseous waste loads generated during industrial painting processes. Four abailable classes of paints applied by one or more of six painting techniques.

R803486

A wide variety of environmental chemicals including insecticides have been shown to alter the activity of the microsomal enzyme aryl hydrocarbon hydroxylase. This effect of insecticides may influence the carcinogenicity of polycyclic aromatic hydrocarbons (e.g. benzo(a)pyrene) Information is needed on the carcinogenicity of the widely used insecticides, and the influence of exposure to these insecticides on the metabolism and carcinogenic action of polycyclic aromatic hydrocarbons. This study has the goal of determining whether exposure to low levels of the organophosphate insecticide parathion is carcinogenic, and if there is a significant interaction between this insecticide and the carcinogen benzo(a)pyrene. The effect of dietary feeding of parathion on the metabolism of benzo(a)pyrene will be measured in vitro with the view toward determining whether an observed effect may be expected to influence the carcinogenicity of benzo(a)pyrene. Our research has been extended to investigate also the effects of other chemical prototype insecticides, such as the organochlorine (e.g. toxaphene) and carbamate (e.g. carbaryl) type compounds. Benzo(a)pyrene will be administered to female Ha/ICR and A/HeJ strains of mice that are highly susceptible to stomach and lung tumors respectively. The data obtained from these studies might provide some basis for evaluating the potential hazards to public health of combined exposure to insecticides and carcinogenic polycyclic aromatic hydrocarbons in our environment.

R803510

The overall objectives of this project are, A. to further develop and refine efficient rapid and inexpensive monitoring methods for the detection and quantitative assay of low levels of viruses in large volumes of water and wastewater, and to evaluat various promising virus monitoring and detection methods by standardized and controlled procedures. B. To develop effective and economical procedures for the inactivation of enteric viruses in wastewater, renovated water and other forms of polluted water by ozone and to establish reliable methods for the control and evaluation of the process.

R803520

The primary objective of this project is to measure the emission of sulfuric acid aerosol from a population of catalyst vehicles as they accumulate mileage in normal use. At approximately 5,000 mile intervals, each vehicle undergoes a comprehensive emissions test consisting of the following sequence: (1) a 1975 Federal emissions test (FTP), (2) a one-hour 50 mph steady cruise, and (3) a series of five tests following a "sulfate driving cycle" developed by the EPA. In addition to measuring carbon monoxide, hydrocarbons, nitrogen oxides and SO_2, a dilution tunnel with iso-kinetic sample probes are used to collect filter samples for sulfuric acid and total particulate mass measurements from each test segment. Analysis of particulate sulfate mass is by the barium chloranilate (BCA) method, and X-ray fluroescence for mass emission rates of ten selected elements: lead, sulfur, phosphorous, platinum, calcium, silicone, copper, aluminum, zinc and iron. Fuel economy is measured by carbon balance technique, and between test intervals by an in-line totalizing fuel meter installed on each vehicle. Tank fuel is collected at each test and analyzed for trace components, especially sulfur content. Prior to each test, each vehicle is diagnostically examined for tune-up condition. Over 130 completed test sequences on 50 cars have been completed in this second year of a three-year project. Under a modification to the scope of work, real-time analyses of emissions before and after the catalyst are being added to the original test procedure. These data will permit a more detailed analysis of catalyst and engine performance and their interplay as it affects overall emissions.

The proposed third year effort will include (1) continuance of testing on existing fleet, (2) addition of real-time data acquisition to measure converter performance, and (3) expansion of fleet to include 1977 model year vehicles and increase to fleet size.

S803565

"Demonstration of Irrigation Return Flow Salinity Control in the Upper Rio Grande." The general objective of this project is to show the feasibility of alternative water management practices in the quality of drainage return flow and soil salinity in the Upper Rio Grande Basin.

R803578

The effects of one pesticide can affect the actions of still a second agent to produce altered biological effects upon the male reproductive system. These pesticide interactions can occur in hepatic microsomal enzyme systems responsible for metabolizing androgen. However, changes in the biotransformation of ^{3}H-testosterone can also occur in male sex hormone dependent organs.

These studies will continue to investigate the interaction of dieldrin and parathion, of dieldrin and carbaryl, and of parathion and carbaryl upon androgen metabolism in the liver and prostate glands of sexually mature mice. Efforts will be directed toward elucidating some of the mechanisms of pesticide interactions upon the male endocrine system.

S803627

The overall objective of the project would be to show that a full-scale anaerobic filter will treat young leachate from a landfill. In achieving this objective, the following subset of objectives will be attained:

1. Develop, conduct, and report on bench-scale testing, rational procedures, and results.
2. Develop and report design rational, procedures, and calculations.
3. Construct the treatment system, reporting procedures, problems, and problem resolution.
4. Evaluate the system, reporting on operating and maintenance procedures, and problems and system performance.

The reports will be developed with the objective of providing guidance to other communities contemplating building a leachate treatment plant.

Summary

The project would be phased as follows:

I. Preliminary Analyses - Leachate samples would be collected and analyzed.
II. Bench-Scale Testing - A bench-scale anaerobic filter test would be conducted using leachate from the site.
III. Hydrogeologic Study of Site - The hydrogeology and soils of the site would be analyzed and described, providing an assessment of leachate flow rates on which to base system design. A leachate collection system will be designed in this phase based on results of the hydrogeological study.

R803652

The proposed research involves the measurement of gas production rates and leachate composition as a result of solid waste stabilization under anaerobic conditions. This research is important to determine the relation between methane generation used for energy conversion and ratio of solid waste stabilization. Test facilities have been constructed and gas production observed.

R803664

The objective of this research and development program is to optimize the presently investigated cellulose pretreatment and acid hydrolysis techniques and to develop the data necessary for design and scale up of the most promising system for a 1-ton cellulose day pilot plant for the utilization of the cellulose values from solid wastes by conversion to glucose. A two phase study is proposed to attain this objective. Phase I involves the experimental optimization of pretreatment and acid hydrolysis technology and the development of data which will identify the most promising system for design and scale up to the pilot plant size on a cost effective basis. All process steps will be studied with particular attention to improving upon and rationalizing current procedures for glucose product recovery. Glucose sample products will be submitted to the contracting agency for study and evaluation.

In Phase II the data necessary for design and scale up of the waste cellulose conversio process under study will be developed so that a complete engineering and economic study of the proposed 1-ton cellulose/day pilot plant for utilizaton of the cellulose values of various solid waste feedstocks by conversion to glucose. The waste cellulose feedstocks will be selected from agricultural, industrial, and municipal sources. The design study will include estimates of process investment and operating costs as well as a technical and economic comparison of the process with other methods of glucose production. Recommendation will be made for further actions to best implement the process technology developed in this research program.

R803704

The present project is directed towards the problem of the dispersion and fate of hazardous materials in large lakes and emphasizes the dispersion and fate of hazardous materials in the near-shore and near-bottom aquatic and sedimentary environments. Three subprojects on numerical modeling have been initiated. These are concerned with the Cleveland Harbor, the Western Basin of Lake Erie, and a simplified two-dimensional model of stratified flow. Field observations have been made in Cleveland Harbor and the Western Basin. Laboratory and field studies have also been initiated to study sediment-water exchange processes. The emphasis is on understanding qualitatively and quantitatively the relative contributions to transfer from the sediments of resuspension and deposition, molecular diffusion, biological reworking of sediments and possible combined effects.

R803754

(1) Research objectives are to develop the theory of the sampling strategy optimization procedure described below and to apply the approach to trend detection and eutrophication studies of Lake Michigan.

(2) This approach exploits the power of the Kalman Filter, an estimation procedure used widely in aerospace control systems. The filter combines both measurement and model information to estimate a variable of interest. If the variances of measurements and model parameters are known, then the variance of the Kalman estimate can be computed before measurements are actually taken. This project has considered the minimization of measurement cost subject to constraints on the estimate variance.

(3) An algorithm has been developed to solve this minimization problem. It solves a sequence of linearized problems, each by the methods of linear programming. The problem of estimating long-term trends in Lake Michigan pollutants is considered in detail. Lakewide average spring concentrations of chloride and total phosphorus are the variables to be estimated. Models have been hypothesized and parameter accuracy assessed. Lakewide average measurements and annual tributary load measurements are both optimized. Plans include application of the algorithm to this system and to a second problem involving assessment of the eutrophic state of the lake via seasonal sampling.

R803765

The method of digital photo electron autocorrelation technique in Laser Doppler S Spectroscopy (LDS) is applied in determining essentially the size of particulates in aerosols and hydrosls in the laboratory. The application of the technique in the charecterisation of the scattered and transmitted light will be investigated. The results will be compared with the relatively unexplored but reliable conventional scattering measurements based on Specific turbidity and Turbididity spectrum. The validity of the results will be further tested by Electron microscopic measurements.

The developement of the above methods and their relative merits with respects to other rountine methods in their application to the in-situ monitoring of particulates in stationary source emission will be studied and critically discussed. The results obtained by the proposed research are expected to indicate greater accuracy, speed and ease of measurement, which makes the technique employed potentially important in the field of pollution monitoring, especially in the determination of particulate size in smoke plumes.

R803786

Objectives: 1. Study the effects of Sevin, Methyl Parathion, and Malathion singly and in combinations, on respiration, respiratory enzymes, and osmoregulation of *Penaeus duorarum* and *Cyprinodon variegatus*.

Determination of these effects on marine organisms is the main objective.

Approach:
1. Conduct bioassays in continuous flow systems in the laboratory to determine the chronic and acute dosage levels of single and combinations of pesticides.
2. Study the physiological stress as related to oxygen consumption of pink shrimps under constant salinity, and altered salinity conditions. The size of shrimp will be another factor examined.
3. If respiratory stress is detected, then conduct Succinicdehydrogenase enzyme assays on gills of the species.
4. Study the osmotic concentrations of body fluids of shrimp and fish exposed to acute and chronic dosages of single and combinations of pesticides.

Current plans: Awaiting the decision of EPA concerning the funding of this project.

R803788

Objective: Demonstrate the feasibility and investigate the durability and economics of the electrolytic process for treating oily wastewater from a manufacturing plant.

Approach: Demulsification is accomplished by passing plant oily wastewater emulsion through permeable iron electrodes.

Current Plans and Progress: During the first year of the program, a one gallon per minute electrolytic unit was constructed and placed in a manufacturing plant and eight batches (about 3000 gal each) of the plant oily wastewater were processed through the unit. The oil content of the processed water generally was below 50 ppm and in several cases below 10 ppm. The second year of the program will include optimization of this system with respect to current and flow rates as a function of plant effluent composition, investigation of the sludge flotation scheme, and a preliminary examination regarding utilization of the oil-rich sludge.

R803798

Arsenic and selenium, as set in 1962 by the United States Public Health Service, are permitted to exist in water supplies at concentrations less than or equal to 0.05 mg/l and 0.01 mg/l, respectively. Water containing concentrations greater than these amounts present grounds for rejection. The objectives of this project is to determine human body burdens of arsenic and selenium after consumption of water from local water supplies containing these elements at concentrations greater than or equal to the above levels. Results of these determinations will be correlated with specific disease indices as determined by questionnaire.

The approach taken will be to establish control and experimental groups for varying intakes of the two elements. The control group will consist of those individuals consuming water containing arsenic and selenium below or equal to the drinking water standard with the experimental group consisting of those individuals consuming water at concentrations higher than prescribed. Hair, urine, and blood will be analyzed for the two elements on both study groups. Also food and autopsy samples from the study areas will be analyzed. Results obtained from the above analyses will be correlated with data obtained from a history of various diseases as determined by the questionnaire and from vital statistics data of each area.

R803802

The atmospheric fates of many of the halogenated and nonhalogenated pollutants proposed here for investigative study are poorly understood. Significant quantities of these chemicals are emitted into the atmosphere, and the sources of these chemicals are primarily anthropogenic. The possibility of stratospheric ozone destruction by stable halocarbons and the toxicity and carcinogenicity of many other halocarbons make continued research urgent. The amount of these chemical pollutants in the atmosphere is rapidly increasing and is a cause for concern. Halocarbons have also been used as tracers that provide an opportunity to understand pollutant transport from urban centers. More recently, reacting halocarbons have provided important information on the chemistry of the natural troposphere.

The overall objective of our three-year research effort has been to determine the distribution, sources, and sinks of important halogenated and nonhalogenated pollutants that have an effect on the stratospheric ozone. During the first two years of research we have developed the urban-nonurban relationships of halocarbon pollutants based on a number of field studies on the west coast. Extensive southern hemispheric data has also been collected. In the third year our emphasis will be on collecting additional data from a number of both clean and contaminated sites. The entire data base collected to date will be analyzed and a comprehensive final report will be prepared. The growth patterns of atmospheric halocarbons will be quantitatively determined. Global emissions data for halocarbons will be used to determine halocarbon atmospheric lifetimes. Methyl chloroform data will be analyzed to determine hydroxyl radical concentrations in the troposphere.

R803804

Three pilot infiltration-percolation basins of about 1/6 acre each have been constructed with underdrains at a depth of 2½ feet in silty loam soil. The normal ground water depth is about 4 feet. Stabilization pond effluent is applied at weekly intervals in quantities equivalent to a depth of 18 or 24 inches. Samples collected from the influent and effluent drain of each basin are analysed for BOD$_5$, suspended solids; ammonia, nitrate and kjeldahl nitrogen; ortho and total phosphorus, specific conductance and fecal coliforms. Infiltration rates are determined using automatic float recorders in each basin. Groundwater levels and quality are also monitored for the area. Specific project objectives are:

1. Demonstrate the use of infiltration-percolation land disposal as a means of up-grading existing secondary treatment to meet new effluent standards...
2. Determine acceptable loading rates for both a scarified and undisturbed soil for climatic conditions similar to those at Brookings, South Dakota.
3. Identify winter operating constraints imposed by the climatic conditions of the site.

Data has been collected since June 1975 and a technical progress report has beenprepared describing the construction and operation of the unit into the summer of 1976.

R803814

"Reactions of Sulfur Dioxide in Aerosols"
To experimentally measure the conversion rate of sulfur dioxide in solution droplets and calculate the reaction rate constants.

R803833

1. General objective: To determine if and how petroleum hydrocarbons affect chemoreception and chemically-stimulated behavior in marine animals. Chemoreception and behavior of lobsters: a) measure effects of 0.1-1.5 ppm #2 fuel oil (Water Accommodated Fraction) on feeding and general behavior of lobsters: detailed behavior analysis. Determine the narrow range of exposure levels that cause effects on chemically stimulated behavior, without causing gross neuromuscular deficiencies. b) Document stimulus effects of direct application of 1-10 ppm #2 fuel oil (WAF) on neurophysiological responses of antennular chemoreceptors of lobsters. c) Determine effects of different petroleum hydrocarbon fractions on lobster behavior and chemoreception using selected compounds from chemically separated fractions. d) Determine contribution of oil-affected chemoreception on behavioral deficits: neurophysiology and morphology of oil-exposed lobster antennules, comparison of oil effects on lobsters with and without antennules, synthesis of project results. Chronic effects on field populations: a) Compare feeding, substrate selection, and anti-predatior behavior of three inshore species (Crangon septemspinosus, Fundulus heteroclitus, and Pseudopleuronects americanus) from oil spill and uncontaminated sites along Buzzards Bay, Massachusetts. b) Compare feeding and general behavior of lobsters (Homarus americanus)taken from oil spill areas and clean habitats, immediately after a spill, if one occurs. c) Compare alarm and feeding responses of Nassarius osboletus taken form oiled and clean habitats.

2. Approach: Behavioral and neurophysiological bioassa-s; flow-through oil dosing chemical monitoring of exposure levels.

3. Progress: Low Sublethal levels of No. 2 fuel oil (WAF) interfere with lobster feeding behavior and oil acts as a chemical stimulus on distance chemoreceptors.

R803851

Aerosol size distributions are being measured in St. Louis as part of the RAP's program from both ground based and aircraft mobile laboratories. These measurements are being made in conjunction with a complete array of chemical, physical and meteorological measurements. In conjunction with other collaborators of the team, new models for the conversion and transport of sulfate aerosols are being developed.

Also, experiments on the generation of sulfate aerosols, SO_2, NO_x,HC, and hetrogeneous aerosols are being conducted ina laboratory smog chamber.

In addition to providing a new data base for sulfur conversion, these experiments have already provided a new understanding of the fate of sulfur in urban and power plant plumes. Also, a new trimodal model for atmospheric aerosol size distributions has been de developed.

Improvements in thealready developed automatic aerosols size distribution measuring systems will be made. A new automatic aircraft aerosol sampler for micoscopy is being developed.

Extensive efforts are also being made to develop procedures for handling large quantities of miltivariable air pollution data using a special laboratory computer system.

R803875

"Energy Conservation Through Point Source Recycle with High Temperature Hyperfiltration" Extension of Current work to include investigation of a combination of ultrafiltration and hyperfiltration and its applicability to continuous dying operations.

R803881

The objective of this proposed investigation is to collect accurate data on particulate and gaseous pollutant concentrations and detailed micrometeorological data in the vicinity of a major highway in a non-urban setting. It is also proposed to conduct tracer gas experiments for the purpose of evaluating vehicle emission factors and dispersion coefficients. A site on a relatively undeveloped section of the heavily travelled Long Island Expressway will be used for the collection of data over a period of one year for the purpose of: (1) documentation of the distribution of carbon monoxide, lead, sulfate, and total particulates at an array of sampling points adjacent to a highway; (2) studying in detail the micrometeorology of highways, with special attention to those parameters important in the determination of sigma and stability values and highway generated turbulence; (3) reevaluating highway air pollutant emission factors from data gathered in tracer gas experiments; and (4) validating the applicability of existing highway air pollutant dispersion models.

R803885

The aim of this project is to determine what effects the exposure of experimental animals to pesticides may have on their immune response. Pesticides to be examined include Baygon, Cacodylic Acid, Carbaryl, p,p'-DDT, Diazinon, 2,4-D, Dinoseb, Hexachlorobenzene, Malathion, Maneb, Paraquat, PCNB, Rotenone, 2,4,5-T, Thiodan and Zineb. Both the humoral immune response and the cellular immune response will be monitored by fluorescence methods. Results obtained to date indicate a lowering of the antibody binding affinity in animals treated with Aldrin or Diquat. Parathion and Dinoseb depress the immune response at all stages of immunization. Carbaryl, DDT and PCNB elevate the response transiently and later depress it.

R803887

A comprehensive study is being conducted to characterize the occurrence of sulfur in aerosol particles at sampling stations in locations between the mid-continent and eastern seaboard of continental U.S.A. Additional remote stations in marine and continental areas are also being operated to provide important background information. Emphasis is being placed on the concentrations of sulfur in relation to other elements present in the aerosol and on the time variability of these concentrations with a time resolution of 2 hours. Sampling is being carried out continuously at heights from ground level to 30 meters by a unique time sequence filter sampler which has been developed at Florida State University. Additional samples are planned to be taken during intensive periods during the year by cascade impactors at about five of the filter sampling sites, using cascade impactors for determination of the particle size distribution of sulfur and related elements. Elemental analysis is performed using proton induced X-ray emission, a highly sensitive technique permitting both the extremely short 2-hour time resolution on a continuous basis for filter samples as well as the size resolution of particles as small as 0.25 µm diameter by cascade impactors. By means of the combination of sampling techniques, the impact of fossil fuel combustion and other anthropogenic sources of sulfur on the natural characteristics of the atmosphere may be precisely determined.

R803896

The objective of this program as a part of project MISTT (Midwest Interstate Sulfur Transformation and Transport) is the quantitative determination of the fate of atmospheric sulfur, i.e. the rate of sulfate formation and the rate of SO_2 removal to the ground.

Large plumes emitted from the elevated (power plant) and low level sources (urban) were studied on the regional scale. Airborne measurements in the plumes and background air outside the plume were carried out for SO_2 O_3 NO_x, b_{scat}, aerosol charge, particulate sulfur concentration and supported by extensive meteorological measurements.

Sulfur budgets of well defined plumes were assessed. Transport of pollutants in plumes was characterized in terms of horizontal "long range transport" and vertical transport. The importance of dry removal for different types of plumes and meteorological conditions was assessed. SO_2 to particulate sulfate conversion rates were determined for the coal-fired Labadie power plant plume and the diurnal variability (1-4% per hour for noon hours and 0.5% per hour for night hours) was determined.

R803903

Program Objectives: This research grant application renewal, prepared by the City of Ames and its sub-contractors, is for a third year continuation of a three-year program to conduct an in-depth evaluation of the environmental, economic, and technical aspects of a full-scale on-line solid waste recovery system. This system is producing refuse-derived-fuel to supplement firing in coal-fired steam generators and is providing for valuable metal recovery. The program has the following principal objectives: (1) Technical, economic and environmental evaluation of the facilities and equipment, individually and as a system, including both the processing plant and associated power plant operations; (2) Characterization of the refuse fuel and byproduct materials produced by the system; (3) Determination of the environmental impact of firing MSW as a supplementary fuel in a utility boiler, including air, water and solids effects. Laboratory analysis and measurement instrumentation is being conducted by E.R.D.A. Ames Laboratory (Iowa State University) personnel.

R803915

R803986

The objectives of this project are to determine the concentration of polychlorobiphenyls (PCB) in the atmosphere and precipitation in Chicago and their distribution in the Lake Michigan basin. The washout coefficient for PCB by precipitation will be determined and this, along with the above information will permit the inputs of these materials in precipitation to Lake Michigan to be determined. The distribution of the PCB in the atmosphere between vapor and material adsorbed on aerosols will be determined. Information on other chlorinated hydrocarbons should also be determined.

R803933

The proposed program is to provide information on themicrobial degradation of chlorodane, toxaphene and lindane by isolates obtained from freshwater or sediments. The interaction of these pesticides with microorganisms will be investigated employing two systems-namely an aerobic system (shake flask culture co-metabolic enrichment) and an anaerobic system (trickling filter column). The study will consist of isolating pure microbial cultures or mixed cultures from sediments and water so as to analyze their capability to degrade the compund in fresh-water ponds. The culture conditions for optimum degradation or transformation of the pesticides in the ecosystem will be determined and will include parameterssuch as pH, temperature, aeration or oxygen supply, nutrient requirements and appropriate pesticide concentrations. Rate studies will be made on the degradations of the pesticides and their metabolites formed the carbon dioxide evolution and the chloride release from these chemicals. Special emphasis will be placed on the identificatin of methabolites that have known of potential health significance i.e., carcinogenic and mutagenic agents.

R803918

Objectives: To investigate selected effects of stack emissions associated with coal-burning on plant growth and metabolism.

Approach:

(1) Study uptake of metallic mercury from the vapor phase by plants and its subsequent biotransformations.
(2) Study uptake by plants and behavior in soils of inorganic divalent mercury.
(3) Study effects of stack emissions upon primary aspects of photosynthesis and photosynthetically-linked nitrogen fixation.

Current Progress:

A closed system has been developed whereby plants can be exposed to regulated low concentrations of radioactively labeled mercury vapor. Wheat, corn, and sunflower plants have been shown to absorb and retain metallic mercury vapor at these low concentrations.

Leaves have the greatest affinity for mercury. For the period of exposure (5 hours), and the concentrations examined (0.9 to 5.3 $\mu g\ m^{-3}$), leaf uptake was linearly related to concentration. In light, mercury uptake per unit of vapor concentration was less in corn than wheat and sunflower, which were similar. All species displayed a marked reduction in uptake in darkness. The absorbed mercury had a low mobility within plants.

R803963

During the first year of this grant, we have studied in a preliminary way three compounds from the original group in both rats and monkeys. The objectives of the second year will be: 1) to complete a 90 day study of 1,2,4-trichlorobenzene in rhesus monkeys with special emphasis on the effects of this compound on enzyme induction and metabolism; 2) more detailed studies of the other compounds included in our quarterly reports. These data should be of assistance in defining certain important metabolic parameters of these compounds.

R803967

Objectives: To develop a simplified method for keeping fecal streptococci and coliforms in water samples in a viable, static condition under conditions of transport where variations in temperature could occur.

Procedures: 1. A combination of nutriments and antibiotics will be used for maintaining E. coli and S. faecalis in filtered waters.

2. The combination of nutriments and antibiotics will be used for maintaining indicator bacteria in polluted water samples and samples containing industrial wastes.

R803968

The objectives of this work are to continue a study of the occurrence and toxicity of various contaminants and groups of contaminants found in renovated wastewaters. The study will involve the use of mammalian cells (platelets and neutrophils) to study the toxicity of concentrates and various fractions of the concentrates when added to cell cultures in vitro. The testing of cytotoxicity of the concentrates will serve as primary toxicity screens, furthermore by separating the concentrate into various chemical classes such as polynuclear aromatic hydrocarbons, chlorinated hydrocarbons, etc., the various chemical groups can be tested as groups for toxicity. Thus the cytotoxicity tests will serve as indicators of the most important chemical groups and compounds. The work will consist of the use of various techniques to concentrate contaminants in renovated wastewater. These concentrates will then be tested for toxicity to the cell cultures (both in terms of functional effects and effects on energy metabolism). The concentrates will be further fractionated and tested again for toxicity. The cells to be used will be obtained from both animals and human volunteers.

R803978

This project will seek to identify, organize and interpret technical and commercial literature resources on oil/water separation. Separations are to be classified on two bases: the physical characteristics of an oil/water mixture (solution) and the concept(s) of the separation device or process. Systems will be referred to a two-dimensional matrix, allowing multiple entry, with physical properties and separation concepts as indices. Annotation will attempt to assemble detailed information on design considerations and operating characteristics of separation devices and processes.

R803983

1. Objectives. To ascertain the biological and chemical responses of a tropical coral reef/estuary ecosystem to the termination of sewage stress. To what extent and at what rate does the ecosystem return to pre-stress conditions?

2. Approach. Field monitoring and field and laboratory experiments are being performed.

   We have 1+ years of time-series pre-diversion baseline data, and we anticipate collecting 1+ years of post diversion recovery data. We will then be able to document the recovery characteristics of the ecosystem and derive predictive ability therefrom. We have published several papers andhave prepared two annual reports to date.

The objectives of this study are (1) to determine the quantity of enterovirus which must be ingested with drinking water to produce an infection, the "Oral Infectious Dose" (OID), and (2) to determine how many OID's must be ingested with drinking water to produce disease, the "Oral Pathogenic Dose" (OPD). Swine have been chosen as the best available representatives of man for such a study; they and their homologous enteroviruses comprise our model system. Early-weaned pigs (3-4 weeks old, 15-20 lb.) are tested to determine that they are neither infected nor immune to the virus with which they are challenged. They are housed in individual isolators and challenged with measured doses of virus in drinking water. Starting with one tissue culture dose (plaque-forming unit) per animal, challenge doses are being increased with each successive cycle of experimental animals until the OID and the OPD have been reached. The OID seems significantly to exceed one plaque-forming unit; pathogenesis has yet to occur. Once experiments with one virus serotype have been completed, a second challenge virus will be used in a second series to confirm the initial findings.

R804086

The objective of the proposed work is the development of a management strategy for dealing with variations in internal process control losses which involves (a) the characterization of raw waste variability from selected sources at a number of mills, (b) the selection of suitable process loss detection instrumentation, (c) assembly of computational programs and computer hardware for conduct of a field demonstration of the application of this management strategy and (d) installation of the equipment and conduct of the field demonsrration as a means of assessing the effectiveness of the management strategy.

The proposed project is of interest to those in the pulp and paper industry attempting to manage intermittent process control losses through a system of alternatives such as collection with return to process or tailored discharge to a treatment plant.

R804123

Catalytic hydrodesulfurization (HDS) and hydrodenitrogenation (HDN) reactions for the removal of organic sulfur and nitrogen compounds from liquid fuels are becoming increasingly important as strict sulfur and nitrogen oxide emission standards are set, and "dirtier" oils derived from shale and coal attain wider use.

A quantitative description of the interferences between these two reactions, which have only recently begun to be studied, is necessary for optimal design of commercial processing units. To date, we have studied thiophene, pyridine and quinoline as representative sulfur and nitrogen compounds in a continuous-flow microreactor to model basic interactions. Pyridine inhibits thiophene HDS under all experimental conditions used. Sulfur compounds exhibit a dual effect on the HDN of pyridine; a reaction rate inhibition gives way to an enhancement at more severe reaction conditions. Theoretical considerations have been presented to account for each of these effects. Reactions of more complex compounds and their interactive reaction kinetics are currently under investigation.

R804155

Overall goals of this program have been to demonstrate the feasibility of using coherent anti-Stokes Roman spectroscopy to identify pollutiants in dilute (micromolar) aqueous solutions and to automate its use in conjunction with a liquid chromatograpg. At the present time, efforts are divided almost equally among three aspects: automation, chromatogrpahy and spectroscopy. With regard to automation, construction of the hardware for interfacing is proceding well and is expected to be finished early in 1978. Then, writing and debugging of software will be started. Because programming will be done in real-time BASIC, for which many of the assembly-language service routines are already available, it should be possible to develop and test modules of the overall operating program relatively easily. The other major aspects , the chromatography and the spectroscopy will concentrate upon one or two typical polychalorinated bipheny is for use as test solutes. If time remains, a typical polynuclear aromatic hydrocarbon, nitrosamine, and carbamate, will be included.

R804161

The basic objectives of the proposed study are: (L) to determine the minimum human oral infective dose of Sabin type 1 poliovirus strain in infants, (2) define the age specific rate of acquisition of antibodies to a number of important enteroviruses in young children with similar socioeconomic backgrounds who have different drinking water sources, (3) determine by serologic testing the incidence of enterovirus infections in children who participate in swimming classes at urban beaches and pools and compare to a control group engaged in non-swimming team sports, and (4) determine the frequency of recent exposure to recreational waters by children seeking medical attention with confirmed enteroviral illness and compare to a control group being seen for non-infectious problems. Data obtained from this study will indicate whether: (1) infants can be experimentally infected with very low oral doses of enterovirus, (2) children with similar socioeconomic backgrounds who are exposed to different types of drinking and recreational water sources acquire enterovirus infections at different rates, (3) children who swim frequently at beaches or pools acquire more infections than children who participate in non-swimming team sports, and (4) children with enteroviral illnesses have recently had greater frequency of swimming than children who did not acquire enteroviral illness during this time.

R804164

A number of metallic ions - chromium, copper, cobalt, mercury, molybdenum, nickel etc., interfere in the determination of total arsenic by the silver diethyldithiocarbamate (Standard Methods, 1971). Usually these ions are present in low concentration in natural waters and pose no problem, but in the industrial waste discharges, the concentration of the these ions is intollerable for the accurate evaluationof arsenic.

The proposed research will study the range of ionic interfering and will develop a method for quantitative separation of arsenic from such ions. Two approaches will be tried for eventual selection of one.

I. The arsenic will be reduced to arsenic (III), trichloride by cuprous chloride in the hydrochloric acid solution. The arsenic (III) trichloride will be separated by distillation and arsenic determined in the distillate by SDDC (Standard Methods, 1971).

II. Arsenic will be oxidized by nitric-acid and potassium bromide and the excess oxidant destroyed by evaporation to dryness. The residue will be dissolved in dilute hydrochloric acid. Arsenic will be separated by eluting this solution through a column of cation exchange resin in the hydrogen form. The arsenic will be determined in the purged liquid by the SDDC method (Standard Methods, 1971).

R804175

Supersaturation of air in natural waters either by hydroelectric plants or thermal effluents is becoming an increasing environmental problem and has already accounted for large mortalities of anandromous fish in the northwestern United States. Increasing development of hydroelectric and/or nuclear plants as a result of increased energy needs can be expected to increase this problem, definition of which requires less specialized, easily available analytical techniques.

The methods currently available for measuring and/or monitoring total dissolved gas pressure in liquids, while accurate and reliable, are expensive, require specialists for operation, and are not suitable for continuous unattended monitoring.

The objective of the project is the design and development of simple, inexpensive instrumentation using the existing principle of a diffusion membrane and electronic pressure transducer to measure and record total dissolved gas pressures. Alternatives for membrane materials, configurations and mechanical interfaces and signal analysis will be explored, constructed and field tested.

R804179

The objective of this project is to apply ion exchange to the determination of trace metal ions at submicromolar concentration levels. Two methods are being investigated. (1) Trace ions in a sample donor solution are concentrated by loading upon a pellicular ion exchanger, and these areeluted or stripped into an acceptor solution at an enhanced concentration level so that they can be more easily measured. In studies with Cu(II), enhancements over 100-fold have been obtained that are in accord with the theoretical Donnen enhancement. (2) In another phase of this project, the kinetic and equilibrium properties of the copper ion-selective electrode are being investigated in the submicromolar concentration region. When they have become elucidated and measurable, these properties may serve to characterize the electrode, or they may have analytical usefulness.

Keywords: Ion exchange, trace metal ions, copper ion, ion-selective electrode, speciation.

R804200

I propose to study the effect environmental contaiminants--particularly at subclinical doses--will have on cell-mediated immunity and to explore possible mechanisms of alteration by observing characteristics of macrophages and lymphocytes. Several different cell-mediated tests will be utilized and subclinical doses of the contaminants will be administered. Lead will be examined initially, but the effect of other heavy metals and insecticides will be maeasured should lead alter the immune response in mice.

Lead acetate will be administered in the drinking water of mice for prolonged periods so there will be a gradual accumulation simulating natural conditions. Kidneys will be analyzed for content of lead to determine actual concentration and histopathology will determine alterations that may occur from exposure. We will endeavor or indirect sensitization of mice with Bacillus Calmette--Guerin (BCG); possible decrease of phagocytosis of macrophages via measurement using opsonized sheep red blood cells (SRBC); possible suppression of T lymphocyte activity by injecting footpads and measuring CMI; possible suppression of T cell helper function in humoral antibody response and measure the effect of macrophage helper function.

If low lwvels of environmental contaminants render the hos tmore susceptible to cell-meidated immunity, then permissible levels of these compounds for humans should be re-examined.

R804202

The objectives are:

1. Conduct a comparative survey of organic residues of drinking water using both bacterial and tissue culture systems for in vitro detection of active mutagens and carcinogens.

2. Analyze pathways of metabolite activation for mutagenesis/carcinogenesis using the 2 in vitro detector systems.

3. Study the modes of action of certain carcinogens and carcinogen metabolites in bacterial DNA metabolism and in the mechanism for transformation of tissue culture cells.

4. To analyze samples of processed drinking water for mammalian cell toxicity and bacterial mutagenicity.

Bacterial assay system is the Ames tester set of Salmonella typhimurium, using rat microsomal preparations. Mammalian cell studies employ 3T3 and 10T½ cells in analyses of toxicity, unscheduled DNA synthesis, and the effect of test mixtures and compounds as carcinogens or co-carcinogens as measured by transformation. A set of 5 previously identified organic constituents of drinking water are being examined for metabolic activation. The compounds are being tested as toxic substances per se, as precursors capable of metabolic activation to more toxic, mutagenic, or carcinogenic metabolites, and as inducers of hepatic metabolism.

Samples tested are drinking water, reverse osmosis concentrates, organic solvent extracts of such concentrates, and concentrates of drinking water obtained by experimental processing methods.

R804218

The objective of this study is to critically evaluate the tentative Standard Methods procedures for concentrating and detecting enteric viruses in large volumes of drinking water and other finished waters. The evaluation of the procedures is being done with a total of nine different viruses representing the four major enteric virus groups. These viruses are: poliovirus type 1, coxsackieviruses A9 and B3, echovirus 7, bovine enterovirus type 1, reovirus type 3, adenovirus type 1, simian virus 11 and Minute Virus of Mice. In a later phase of the evaluation, mixtures of naturally occurring enteric viruses obtained from wastewater will also be utilized. The four different types of microporous filters that are currently recommended as virus adsorbents are being simultaneously evaluated using 100 gallon volumes of tapwater experimentally contaminated with low levels of the test viruses. All aspects of the tentative Standard Methods procedure are being investigated, including primary virus adsorption, primary virus elution and reconcentration. If the presently recommended tentative Standard Methods procedures for concentrating and detecting enteric viruses in finished waters are found to be incapable of efficiently recovering certain enteric viruses, then modifications of the methodology will be investigated and evaluated.

The objectives of this project are to (a) measure denitrification in a field soil directly from the fluxes of N_2 and N_2O at the soil surface, (b) compare denitrification obtained from N_2 and N_2O gas fluxes with denitrification obtained by difference, and (c) measure the amount of denitrification from an applied inorganic fertilizer source as affected by an actively growing crop or manure amendment, water content, and temperature of a field soil. Denitrification will be determined directly from field-measured gas concentration gradients and diffusion coefficients of N_2 and N_2O gases evolved from nitrate fertilizer labeled with ^{15}N. Soil, grass, and leachate samples will be analyzed to determine the amount of N immobilization in soil, plant uptake, and leaching loss in order to calculate denitrification by difference. The results of this research will be used to evaluate the feasibility and accuracy of using a direct determination of denitrification and will give results on the amount and dynamics of denitrification under field conditions.

R804278

"Analysis of Tower Measurements of Turbulence for Nonuniform Fetches"
The objective of this grant is to obtain a betterunderstanding of atomospheric turbulence from analyses of tower data collected in the layer up to 300 meters above the surface in complex terrain and RRS boundary layer data and also to update and to extend techniques for predicting atmospheric dispersion in the planetary boundary layer.

R804283

"Effects of Metals and Herbicides on Migration and Sea Water Adaptation of Juvenile Coho"
Salmon--development of data on the upper concentration limits (in fresh water) of several haerbicides that will not adversely affect downstream migration or sea water adaptation in juvenile coho salmon.

R804290

The proposed research will investigate the effects of 2,4-dinitrotoluene, 2,3,7,8-tetrachlorodibenzo-p-dioxin, and hexachlorobenzene in the adult male albino rat. Potential antifertility effects, and the reversibility of these effects, will be determined by twelve week feeding studies with subsequent mating and by daily oral intubation with serial mating. The mutagenic potential will be assessed by the classical rat dominant lethal assay. To determine the mode of action of these agents, the integrity of the pituitary-gonadal endocrine system will be assessed by monitoring LH, FSH, and testosterone levels at weekly intervals during chronic oral administration. In addition, the ability of these agents to penetrate the blood-testicular barrier (BTB) will be assessed by rete testis cannulation and efferent duct ligation experiments. The mechanism of penetration will be determined in vitro (i.e. active or passive). If these agents traverse the BTB, their effects on DNA, RNA, and protein synthesis in the developing spermatogenic cells will be determined. These data will provide a basis for the establishment of a safe intake level using reproductive performance as a sensitive index of safety.

R804291

(1) a) To determine the relationship between different dosages of H_2SO_4 aerosol (continuous and intermittent exposures) and both visible and subtle effects on some important crop and tree species; b) To develop and describe the range of visible symptoms induced on different plants by the acid aerosol; c) To determine the environmental conditions under which maximum injury is observed and d) To develop a catalog of plants sensitive, intermediate and resistant to H_2SO_4 aerosol based on comparative response.

(2) Plants will be raised under greenhouse conditions and at different stages of growth, will be exposed to different concentrations x durations of H_2SO_4 aerosol in special tubular, all-glass exposure chambers. The system will alow simultaneous exposure of one branch of a plant to the aerosol in an exposure tube and the opposite branch of the same plant to water vapor in another exposure tube (check). H_2SO_4 aerosol will be generated through a positive air pressure system mixing water-saturated filtered air with SO_3.
Parameters such as temperature and relative humidity will be controlled and monitore continuously. Acid aerosol concentration will be measured about every 15 minutes using an ultrasonic transducer - Coulometry System through Gran's plots. Data will be acquired through a computerized acquisition system and will be analyzed with a CYBER-74 computer. All facilities except the tubular glass exposure chamber are available at this time at the University of Minnesota.

(3) Last phase of the study would involve the determination of the response of acid aerosol sensitive plant species, to simultaneous exposure to threshold dosages of H_2SO_4 aerosol and varying concentrations of NH_3. Environmental conditions used will be congenial for acid aerosol injury.

R804292

1. Principal objective--to quantify the presence of nematodes in various treatment units of a water treatment facility by providing answers to these specific questions: (a) Where are the larvae, adults, and gravid nematodes located, and what are their densities? (b) Are there correlations between densities and a physical, chemical, or biological environmental factor which may suggest a cause-effect relationship in the presence and growth of these animals? Subordinate objective--to evaluate scanning electron microscopy (SEM) as a means of quantifying the presence of free living nematodes in water.

2. Approach: The plan for this prlject can be divided into three divisions; the first two are preparatory to the third. (a) The scientific validity of our study will rest largely on the knowledge of what species of nematodes are in the water supply. (b) It is very probable that the scanning electron microscope (SEM) will be used for quantification of nematodes in water. From preliminary observations this method seems to hold promise, but a reliable protocol for the careful preparation of a sample is necessary. (c) The heart of the study will consist of: (1) taking samples from numerous locations throughout the Greenwood Water Treatment Facility, (2) determining the nematode's stages of development and densities and (3) evaluating the data to provide some understanding of the animal's breeding characteristics. We also hope to determine if the population size is dependent upon, or correlated with, an environmental parameter such as a change in nutrients, pH, or mineral content of the water source or the frequency of back-washing the sand filters.

R804311

New polymeric reverse osmosis membranes will be tested on rinse waters from copper cyanide, zinc cyanide, acid copper and chromic acid plating baths. Membranes will include the NS-100, the NS-200, polybenzimidazole and sulphonated polyphenylene oxide. Life tests of 1000-hr duration will be conducted in which membrane flux and rejection are monitored.

R804318

The proposed research will continue to investigate the relationship between dose and duration of exposure to levels of pesticide in blood and saliva. The mechanism of transport into saliva will be established using in vivo and in vitro methods, some of which have been developed in this laboratory. Human samples will be evaluated utilizing the services of the Departments of Agriculture and Pathology.

R804321

The objective of this work is to design and test on a small scale the subsystems necessary to an industrial process which uses a molten salt to convert scrap tires to gas, oil, and carbon black, and to select the best catalyst for the process.

The approach will be to design and construct small bench scale units after a thorough literature survey. Each unit will then be tested and evaluated. The various possible catalysts will be evaluated for effectiveness, lifetime, cost, product value, and corrosion problems and the best one selected.

R804333

This proposal described methods for increasing the sensitivity of on-line measurements of the infrared spectra of species eluting from a gas chromatograph (GC-IR) and a high performance liquid chromatograph (LC-IR) through the use of dual-beam Fourier transform spectrometry. The optics for these systems have already been designed and constructed and further improvements will be tested. In addition methods for solvent elimination for LC-IR are proposed; the effluent from the chromatograph will be sprayed into a vertical heated light-pipe and the sample will be deposited on the walls of the light-pipe. The reflection-absorption spectrum of the deposited sample will then be measured.

The sensitivity of in-situ measurements of the infrared spectra of species separated by thin-layer chromatography (TLC) will be improved through the application of programmed multiple development to reduce the spot size. Finally an infrared scanner for TLC plates will be developed.

R804345

"Chemistry and Mode of Action of Insecticides"
Research is directed toward the understanding of the fundamental processes involved in the various events leading to intoxication and detoxication in mammals and insects. On an overall basis, long-term objectives will be in the general areas of: insecticide selective toxicity, insecticide metabolism, inhibition of cholinesterase, structure-activity relationships, insecticide activation and reactivation,delayed neurotoxicity, impurities in technical organophosphorus insecticides, cause and consequence of insecticidial action, development of new insecticides, insecticide cyclic nucleotide interactions, and gas chromatography of insecticides on modifies supports.

R804348

Kinetic and mechanistic studies will be made to recognize and to quantitatively characterize the several reaction pathways which result in the chemical transformation and removal of SO_2, NO, and NO_2 in the polluted atmosphere. In one phase of the work the seemingly important reactions of the alkyl peroxy and hydroperoxy radicals with SO_2, NO, and NO_2 are being investigated. Kinetic flash spectroscopy, steady state photochemical systems, and studies in flow systems are employed to follow the kinetics of the RO_2 reactions The identification and kinetic characterization of the initial reactive products of these reactions will be attempted using infrared, visible, ultraviolet spectroscopy, mass spectroscopy, and more conventional chemical methods. In other phases of this work we plan to study the reaction pathways which involve the reactions of the electronically excited SO_2 with atmospheric components and the reactions of the HO-radical with SO_2, NO, NO_2, and other atmospheric pollutants of special interest.

The mechanism and kinetic information obtained in the study will be applied directly to the development of a more realistic computer simulation scheme for the prediction of rates of SO_2 and NO_x removal reactions and the nature of the initial "sulfate" and other unidentified and recognized products of the sunlight-irradiated, NO_x, SO_2, RH-polluted atmospheres.

S804350

The principal objective of this project is to conduct an extensive evaluation of ultrafiltration for wastewater treatment at the San Leandro plant of the Dewey and Almy Chemical Division of W. R. Grace. Treatment of this waste by ultrafiltration is an application ofnovel technology to a serious wastewater problem, and provides an economically feasible means of meeting effluent standards for hexane extractables and other contaminants.

This test program will be supplemented by feasibility experiments on the treatment of product waters from ultrafiltration by reverse osmosis and carbon adsorption.

The technical and economic feasibilities of full-scale treatment systems will be assessed.

At the San Leandro plant, utlrafiltration tests will be conducted concurrently with waste characterization tests of the in-feed, concentrate and permeate. A sampler will be used to obtain daily composite effluent samples.

Operating paramenters to be routinely monitored include processing temperature and pressure, the ultrafiltration unit circulation rate and pressure drop, and the ultrafiltration permeate flow rate. The UF unit will be operated continuously for twelve weeks.

In addition to the above, reverse osmosis and carbon adsorption tests will be conducted on the permeate to assess technical and economic feasibilites for treatment of the UF product water to meet the effluent limitations guidelines for the industry.

R804351

The purpose of this study is to obtain information concerning the mode of action, excretion, and metabolism of the cyclodiene insecticides.

A mortality study employing mice was conducted with combinations of toxaphene (T) and methyl parathion (P) to determine possible potentialion between these insecticides. One-half LD doses (T:P, 56:16 mg/kg) were employed as well as a 2:1 combination (T:P, 32:16 mg/kg). Mortality occurred in only combinations containing P; however, there was a lack of potentiation between these two insecticides.

Mice were dosed with combinations of 25 mg/kg ^{36}Cl-toxaphene (T), 3.2 mg/kg ^{14}C-chlordimeform (C), and 12.5 mg/kg methyl parathion (P), i.e., T, P, C, TP, TC, PC, TPC. There were no statistical differences among the various treatment combinations for ^{36}Cl-excretion in the urine. There were differences for feces, but not definite pattern was apparent. The other significant differences were between a single dose and a second dose. Mean separations for these significant differences are in the process of being performed.

A study is being conducted consisting of two parts: effects of toxaphene ingestion on neo-natal development, as determined by certain behavioral criteria and the effects on post-natal maze learning in rats. Results for the maze learning experiments are still progress. The following tests were used to assess neo-natal development: swimming, grasp-hold reflex, righting reflex, and startle response. Treated pups showed a suppression in the development of swimming ability on days 7-9; treated pups showed a stronger grasp-hold reflex on days 15-20 when this response declined in the control group. There was no significant difference in the development, of startle response, and the exposed pups developed the righting reflex two days later than control pups.

Measurements of ionic fluxes for the ventral nerve cord in toxaphene-poisoned

R804353

(1) Objectives: Compare cholinesterase activities, levels of intact organophosphates in blood and adipose tissue, and urinary metabolites of rats exposed to halogenated aryl and aliphatic organophosphorus compounds and non-halogenated aryl and aliphatic organophosphorus pesticides. Relate symptomatology, cholinesterase depression and levels of intact pesticides in blood and urinary excretion of metabolites in persons occupationally exposed to these same chemicals.

(2) Approach: The concentration of intact pesticide in blood and adipose tissue, quantity of urinary metabolites excreted in 24-hour intervals and effect on cholinesterase is measured in rats individually exposed to a dozen organophosphorus pesticides. Human subjects occupationally exposed to the same compounds are monitored for the above parameters in order to determine the validity of the animal model.

(3) Current Plans and/or Progress: Partition coefficients and hydrolytic half-lives have been determined for all pesticides included in the investigation. Recovery studies of metabolites in urine and parent compound in blood and tissue have been completed. A micro-cholinesterase method designed to be used in the animal experiments has been validated. Animal exposure experiments have been completed for eight of the twelve compounds under study. Finally, five of twenty-five occupational case studies have been completed.

R804359

The environmental problems caused by the incorporation of heavy metals (e.g. cadmium, lead and mercury) into our ecosystem have been recognized for several years and have recently received an increasing amount of attention. Presently, very little detailed information is available, on the molecular scale, of the mechanisms of incorporation and action of these metals in biological systems. One of the major problems in ascertaining the role of the metal in biological and toxicological effects has been the lack of sufficient analytical methods to identify the metal and its molecular form. Metals of primary importance to this study, because of the ease in which they can enter the environment are: cadmium, tin, mercury, lead, and to a lesser extent selenium and thallium. These metals are ideally suited for a multinuclear magnetic resonance study involving direct observation of the metal nucleus by Fourier techniques because of their respective receptiveness to an nmr experiment and because they are all spin 1/2 nuclei.

The primary objectives of the research are twofold. Firstly, to characterize in detail the nmr parameters (chemical shifts, lower limits of sensitivity, spin coupling constants, relaxation times (T_1 and T_2) and their respective mechanisms) of representative organometallic and coordination compounds of these metals in solution. This research also entails investigations of these metals interacting with amino acids, hormones and peptide fragments of various sizes. Secondly, based upon the results of the investigations of the nmr parameters, studies have been initiated to follow the interaction of these metals in metalloproteins. This involves the direct observation of the metal in a metalloprotein; and in selected examples (^{113}Cd and ^{207}Pb), experiments have been designed to observe the metal in the protein while the protein is involved in a catalytic role. Such experiments are yielding significant information toward a further understanding of the structure-function role metals play in metalloproteins.

S804360

"Solid Waste Technical Assistance for Local Government Managers"
To provide professional and technical assistance; to disseminate information on all aspects of solid waste management; to provide timely input to EPA on programs, regulations, guideline and legislation; to facilitate the sharing of information to EPA on successful waste practices and the degree to which they exist.

R804393

"Fine Particle Control with U.W. Electrostatic Scrubber"
To demonstrate a device for high efficiency collection of submicron-sized particulate matter from power plant and industrial plant effluent streams by use of charged droplet scrubbing.

R804403

The investigation is concerned with the nature, distribution, and origin of the inorganic constituents of coal. This "mineral matter" in coal is, at times, deleterious and may, among other influences, contribute significantly to problems of air and water pollution. In order to obtain a relatively unaltered mineral matter residue as a starting material for our investigations, the technique of electronic low-temperature ashing is routinely used. After ashing the coal at temperatures below 150°C, the mineral matter residues are investigated by X-ray diffraction, and optical and electron microscopy for mineralogical analyses; by X-ray fluorescence spectroscopy, atomic absorption spectroscopy, optical emission spectroscopy, electron microprobe analyses, neutron activation analyses, and general "wet chemical" methods for elemental analyses.

The major areas of interest in which investigations are continuing are: 1) The mode of occurrence, distribution of trace elements and minerals in coal, 2) the mineralogy and genesis of iron and zinc sulfide minerals in coal seams, 3) mineral and elemental distribution within coals of the Illinois Basin, and 4) the potential for removal of minerals and their constituent chemical elements by coal washing techniques. Data from all of the above investigations are then related to the origin and geochemical history of the coal seams.

R804407

This study consisted of two separate but completely interrelated substudies: 1) macroecosystem study; and 2) microecosystem study.

Macroecosystem. The present study was designed to study the dynamics of a relatively undisturbed marsh-estuarine ecosystem. There are two basic interrelated objectives of this study: 1) to establish baseline data on an undisturbed estuary to provide a scientific basis for comparative studies on the effects of various stresses of pollutant on other estuarine environments; and 2) to develop models of an estuarine ecosystem which would predict the probable effects of environmental perturbation.

Microecosystem. The long range objectives of this study were twofold: 1) The prime objective was to develop and test replicate experimental salt marsh units at the microecosystem level as diagnostic tools for the assessment of both long and short term pollution effects on the *Spartina alterniflora* salt marsh community. 2) Since this study was conducted in conjunction with the ecosystem analysis of North Inlet Estuary, these simulated marshes will be utilized to test, as well as to provide some data relevant to the general overall ecosystem model being constructed for the area.

Results of this integrated study add significantly to our understanding of the marsh-estuarine ecosystem. Not only does this study provide better insight into the functioning of estuarine processes in an undisturbed estuary, but also it provides a basis for the development and validation of predictive models. These models are needed in making decisions on environmental impact of man's activities in the estuarine environment and in developing long term management programs of this vital natural area.

R804418

This is a continuation study that is (a) investigating the influence of particulates in water on the viral disinfection process using chlorine dioxide as the disinfectant and bentonite and alum as the particulates; (b) evaluating the disinfection capabilities of chlorine dioxide using enteroviruses as the test viruses, along with reference bacteria and bacteriophages for comparative purposes at different levels of chlorine dioxide, temperatures, contact times, pH values, and concentrations of particulate matter; (c) determining the effect of viral aggregation on survival of the test microbes during the disinfection process through characterization of the virus inoculum by electron microscopic assay of the viral units; and (d) evaluating the effect of the disinfectant on enterovirus-associated animal cells which simulate naturally-found cell-associated viruses excreted from the intestinal tract of man. In addition, other disinfectants such as hypochlorous acid, hypochlorite ion, and the chloramines will be used to compare their relative viral disinfection efficiencies to that of chlorine dioxide either singly, together, or in sequential addition to determine the effect of combinations of chlorine and chlorine dioxide on the viral disinfection process. The use of chlorine dioxide as a disinfectant in water supplies assumes greater importance when consideration is given to its reduced reactivity with precursor organics in water to form chlorinated organic compounds which may be later identified as carcinogenic. As chlorine dioxide becomes a more used disinfectant because of its lessened capability to form chlorinated organics, more information is required concerning its disinfecting capability and factors that influence such ability. As part of the scope of the second year, a supplementary study will be completed dealing with the chlorine disinfection of *Yersinia enterocolitica*, a bacterium implicated in outbreaks of intestinal disease.

R804455

"Modified Wet Scrubbing of Immiscibles Emitted From Manufacture and Processing of Organic Products."
The study will examine the removal of a series of organic compounds using a modified aqueous scrubbing technique. The pilot investigation will study the effects of changing physical constants to cause an increase in soluability and hence removal of organic compounds.

S804487

"Liberty Lake Rehabilitation Project"
Lake Rehabilitation is in tow main categories: Reduction of incoming nutrients and improvign inlake conditions. Specifically nutrient reduction will be conducted by lake sediment removal, weed and algae control, separation of high-engery marsh from lake, phosphorous precipitation, lake outlet clearing, disposal of high-nutrient waste material on farmland, and public education.

R804536

Objectives--(1) Conduct a field sampling program designed to statistically test whether shading and/or agricultural herbicide factors are related to submerged aquatic vascular plant die-offs in Chesapeake Bay. (2) Conduct microcosm bioassays of herbicides under unstressed and stressed conditions. (3) Directly test for adverse effects of runoff form on plants in large tanks.

Approach--Field data would be collected at a series of stations on tidal Rhode River (on the western shore), tidal Choptank River (on the eastern shore) and near the Poplar Islands (open bay) at a series of times in order to measure species composition and populations of plants; shading factors in the water column, herbicides gactors in bottom sediments, suspended sediments and surface water, and other habitat factors. One species would also be intensively bioassayed in microcosms with atrazine and linuron to test for individual and synergentic effects under unstressed and stressed (low light, high salinity, high temperature) conditions. Estuarine partition coefficients would be approximated. Storm water runoff from a cornfield watershed would be diverted into a large tank containing plants and compared to acontrol tank.

Current Progress - Two years of data has been collected toward objectives (1) and (2). Several publications are in press.

R804562

"Feasibility Study for an Asbesto Aerosol Monitor"
The objective of the study is to determine the feasibility of a new light scattering method, involving the measurement of scattering intensity ratios at two azimuthal angles in the same forward scattering cone, as a basis for an instrument to perform realtime identification and counting of airborne asbesos fibers.

R804603

The major objective of this study is to determine if prolonged exposure to high levels of air pollutants in urban areas of California is associated with increased risk of chronic diseases. This study objective arose out of the need to document in a scientific manner, the disease effects associated with air pollution in urban areas of California. The high pollution areas will be defined by the ambient levels of SO_2, ozone, particulate matter, and NO_2.

The population group to be studied (Seventh-day Adventists) has inherent controlled parameters as a result of its lifestyle. In this stydy a smog questionnaire is being mailed to the study subjects. It includes questions designed to determine the prevalence of Chronic Obstructive Pulmonary Disease (COPD) in the polluted areas of the South Coast Air Basin and to estimate the prevalence of COPD in the rest of California, as well as estimate the relative exposure to air pollutants based on differing lifestyle habits.

R804607

"Chemical Amplifiers as Odd Hydrogen Radical Detectors"
The objective of this proposal is to ultimately measure HO_x species in air samples. This will be accomplished with the use of chemical amplifiers.

R804641

This work is intended to evaluate various factors influencing the effect of environmental pollutants with particular emphasis on trace elements.

Special attention will be paid to differences in absorption, distribution and retention in relation to age, to the estimation of critical organ in the immature, to differences in toxicity due to age, to late effects caused by infant exposure and to nutritional factors and deficiencies as influencing trace element metabolism and effects.

Most of the experimental work is going to be performed on rats using radioactive isotopes of trace elements for studying various metabolic parameters. Stable trace elements are going to be used as additives to different diets to evaluate the effect of chronic exposure and interaction of essential and toxic trace elements. The experiments on humans are envisaged for a later stage.

These investigations are expected to provide a better basis for evaluating the effects of environmental pollutants in the young.

R804642

The objectives of this proposal are to identify the research, development, and demonstration needs for prevention and control of air, land, and water pollution from the Food Industry and to discuss methods of setting program priorities.

SRI will put forth its best effort to provide the necessary personnel, facilities, and services over an eight-month period to conduct a study to identify the research, development, and demonstratinn program needs for pollution control in the food industry. The study will entail four tasks:

Task 1: Development of an Industry Profile
Task 2: Identification and Characterization of Emission Streams
Task 3: Discussion of Control Technology Needs
Task 4: Discussion of Program Priorities

SRI will submit a final report to the EPA at the completion of the project; this document will serve as a planning tool for the EPA in formulation of its environmental control efforts in the food industry.

R804659

We propose to perform calculations, using a recently developed theory, to estimate the effect of particle size and refractive index on the Raman scattering cross sections for molecules comprising all or a constituent part of small particles. These calculations will be coordinate with experimental work at the National Bureau of Standards directed toward the analysis of molecular species contained in small particles. The numerical studies will permit extension of the present technique for qualitative analysis of particulates to a more quantitative basis, since to this point no theory has been available which predicts the dependence of the total Raman signal on particle size, shape, refractive index and orientation with respect to the illumination and collection directions. Calculations to elucidate these dependencies may also lead to estimation of the distribution of the molecular species within the particle (e.g. uniform distribution throughout the particle or concentration in a surface layer). It will also provide information which could lead to improvements in the design of the present instrumentation. Theoretical studies will be undertaken to extend the present theory to nonspherical particles and to nonuniform light source

R804649

The objectives of this work are to

(1) Determine optimal conditions for the extraction of metal and phosphates from anaerobically digested chemically treated sewage sludge using sulfuric acid as the extractant.
(2) To determine similar optimal conditions for aerobic sludges and mixed sludges
(3) To determine the benefits obtained by acid extraction when the residual sludge is to be incinerated.

The approach is to obtain representative samples of sludge from sewage plants in which phosphate removal is practiced, and by carrying out acid extractions with complete and careful analysis of the products to develop sufficient data to allow reliable estimates of process costs to be made.

Current work is described in the paper "Removal of Phosphates and Metals from Sewage Sludges" by D.S. Scott and H. Horlings, J. Env. Sci. Tech., 9, p. 849-55 (1975).

S804690

"Lake Improvement for Lake Phalen" - Proposed restorative action; reduce nutrient input into Lake Phalen by separating combined sanitary sewers, diverting storm water into percolation basins, land acquisition, adding pumped water to the lake, and studying the feasibility of sealing the lake bottom.

S804695

This project will demonstrate the restoration of a 122-acre eutrophic lake in Noble County Indiana through removal of agricultural nutrients (phosphates) from the waters flowing into the lake and the removal or inactivation of phosphates remaining in the lake. Inflow will be controlled through diversion and through the construction and treatment of sediment basins in the major inflowing stream. Nutrients will be removed through weed harvest and through chemical inactivation of the bottom sediments. The project will reduce the eutrophication process, provide better light penetration and a sparser population of vascular hydrophytes.

R804697

"Absorption Characteristics of Prolate Spheriodal Model of Man and Animals at and Near Resonance Frequency" - The objective of the work is to use mathematical modeling methods to predict and better understand the interaction of electromagnetic radiation with biological objects. The model to be used is a prolate spheroid which better represents the anthropomorphic form of most laboratory animals and humans, compared to earlier spherical and planar models.

S804712

"Penn Lake Restoration Project" - Restore the recreational quality of Penn Lake by deepening the lake, aerating the water column, and constructing sediment basins to prevent sediment infilling.

S804728

"Restoration Analysis and Rehabilitation of Medical Lake" - Monthly and semimonthly physical, chemical and biological parameters will be determined at two-meter intervals from the surface to the bottom of the deepest position of the lake. With this information, a determination will be made of the concentration of aluminum sulfate needed to precipitate the available phosphorus in the lake. The aluminum sulfate applications will be made soon after the ice melts in the spring and again at the height of the water stratification in the early fall.

S804730

"Long Lake Restoration" - Project designed to reduce sedimentation, nutrient input, and increase lake depth. This will be accomplished by construction of sedimentation basins, dredging, implementation of erosion control measures, and nutrient and suspended solids removal via a wetland filter.

R804740

Photochemical oxidation of nitric oxide followed by aqueous scrubbing of the reaction products is considered an attractive near term control technique for coal field utility and industrial boilers. The technical and economic limits of the process will be evaluated in this study. The work is particularly important due to the increasing reliance on coal and the inherent limitations of combustion modification techniques for NO_x control.

The specific objectives include the determination of the product quantum yield in both the far ultraviolet band of 1800-2000Å and in the middle ultraviolet band of 2000-3000Å. These parameters will serve as a meaningful indication of the oxidation efficiency of the mechanisms under various physical conditions. The product quantum yield values can be easily translated into energy cost estimates.

A nested continuous stirred tank reactor system (CSTR) has been selected as an optimal design for accurately determining product quantum yield. A simulated stack effluent is irradiated in a commercial quartz 1 liter CSTR which is mounted within a much larger CSTR.

Product analysis is done using a chemiluminescent NO_x analyzer (TECO Model 10A) and a Pulse Fluorescent SO_2 Analyzer (TECO Model 40). The possible presence of aerosol is indicated by a Condensation Nuclei Counter (Environment One). A millipore filter will be used to collect any aerosol formed for subsequent analysis. Nitrogen and sulfur balances will be attempted.

S804755

"Commonwealth Lake Improvement Project"
The project is composed of several schemes to increase the water depth, reduce sedimentation, and reduce nutrient inputs. The alternatives are lakeshore stabilization, deversion of a nearby creek to reduce the hydraulic residence time, forced aeration, drdging, lake bottom sealing, and mechanical and/or chemical treatment to control nuisance growths.

R804763

The detection and location of water levels, water pockets, voids and various other discontinuities between different layers of earth or rock is critical in insuring the performance and safety of earth dams. Such underground anomalies are particularly undersirable in the earth dams and dikes that contain hazardous materials since these relatively small embankments are generally not engineered or constructed in a rigorous and professional manner.

One possible technique for detecting and monitoring such faults and weak areas is the use of microwaves. By beaming continuous or pulsed microwaves at the dike and recording the return signal as it is reflected from the anomaly, the location, type and depth of faults can be determined. A literature search (technical, equipment, legal and safety) will be undertaken and a number of laboratory experiments will be performed to assess the practicality of using microwaves for the non-destructive assessment of dike stability. Basic soil properties such as dielectric constant, conductivity, attenuation, phase shift, and velocity, will also be determined.

The final result of this project will be the detailed specification for a inexpensive, mobile, microwave unit (with known limitations) to determine underground water, irregularities, and discontinuities in small earthen dikes.

R804764

"An Investigation of the Reactions of Aromatic Hydrocarbons in Photochemical Air Pollution" - The primary goal of this effort is to identify the products formed when aromatics are irradiated with NO_x under simulated conditions, and in so doing, establish a mass balance for this system.

S804765

"Lake Henry Protection and Rehabilitation Project" - Project is threefold: increase water depth, reduce sedimentation and reduce nutrient inflow. This will be accomplished by dredging, implementing "best" land use management practices to include stream bank protection and stabilization program.

S804791

"Springfield, Illinois Resource Recovery Implementation Grant" - The purpose of this grant is to financially and technically assist Springfield to implement a municipal solid waste resource recovery system.

R804802

Objectives:

1. Ascertain and evaluate the present and potential impact of two specific lake restoration projects on individuals, participating groups of recreationists, organizations, and communities.
2. Recommend substantive and procedural program changes to local lake districts, University of Wisconsin Extension, Wisconsin Department of Natural Resources, and U.S. Environmental Protection Agency.
3. Contribute to the development of a general methodology for social and economic evaluation of water quality improvement projects.

Approach :

1. Identify and delineate impacted subpopulations.
2. Obtain information on impact from these subpopulations using techniques appropriate to the subpopulation such as personal interviews, observation of recreational behavior, informal interviews with community leaders, and local media.
3. Analyze data relative to single impacts and to aggregate-interactive impact and refine a model of the impacts from such projects.

R804803

Objectives: The objectives for the 2nd and 3rd years of study will depend on the final results of the first year's study of low level (100 $\mu g/m^3$, 0.1-0.3 μm) sulfuric acid inhalation upon the mechanical factors of breathing in normal human subjects. Several options include investigation of the effects of (1) exposures to higher or lower burden of H_2SO_4 aerosol depending upon first year results, (2) additional subjects under the initial protocol if results suggest trend approaching statistical significance, (3) high risk subjects (asthmatics or pulmonary reactors) to low levels (100 $\mu g/m^3$, 0.1-0.3 μm) of sulfuric acid aerosol, (4) normal subjects to sulfuric acid inhalation of ultra-fine (0.02 μm-0.04 μm) particles.

Approach: A modified double blind study is planned. Subjects will be studied in pairs and will spend 6 hours daily in a Class-100 environmentally controlled chamber on 3 successive days. They will not be told which day the 4-hour exposure to H_2SO_4 aerosol will occur. Pulmonary function tests will be done immediately before entering the chamber and every 2 hours thereafter.

Plans: Pulmonary function tests done to evaluate the effects upon respiratory function include: (a) Spirometry, (b) Plethysmographic determination of specific airway conductance and FRC, (c) Closing Volume and Nitrogen Plateau, and (d) Dynamic Compliance.

R804804

The intent of this investigative effort is to develop, through pilot plant testing, a comprehensive approach to the management/treatment of septage that will transform this material into one which is chemically, physically, and biologically safe for reintroduction into the natural environment.

Essentially two strategies exist for the proper management and treatment of septage:

1. Utilization of municipal wastewater treatment facilities as a receiver for this material and/or
2. Construction of facilities exclusively for the processing of septage. Integral to the above will be further definition of the characteristics of untreated septage as well as character transformations resulting from various types of treatment. Investigations on pretreatment, dewatering, resultant aqueous and solids bearing fraction treatment, combined fraction treatment, and combinations of the above are to be undertaken.

The overall outcome of these efforts is designed to:

1. Define the applicability of utilizing equipment normally found at municipal wastewater treatment facilities for the effective treatment of septage,
2. Optimize operational conditions for such equipment so that cost effective, environmentally sound results may be consistently attained, and
3. Derive design and operational parameters for new management/treatment processes.

R804813

The objective of the three year study is to assess in vitro mutagenic/carcinogenic potential of organic substances in renovated wastewaters and attempt to identify the fractions/chemicals responsible for the action. Wastewater renovation plants representing a wide variety of treatment methods - natural sand beds, physical-chemical, and biological, are selected to enable correlation of the data on mutagenicity/carcinogenicity to the treatment technology. The study will provide information on health hazards from reclaimed wastewater for potable use and assist in setting priorities for in-depth toxicological testing.

First year was devoted to assessment of the mutagenic/carcinogenic potential of unconcentrated secondary effluent- and advanced wastewater treatment effluents utilizing Salmonella and yeast mutagenesis assays. Secondary effluent, and lysimeter samples collected from different depths of the sand beds at Lake George AWT Plant showed no mutagenicity. Wastewaters spiked with known mutagens revealed that mutagens can be detected in wastewaters without significant interference from the components of wastewaters with the bioassay system and/or with the activity of mutagens. Secondary and AWT effluent samples collected from Bay Park Water Reclaimation Plant exhibited weak mutagenicity in Salmonella strain TA-1535.

In the second year, concentration of organics from secondary- and AWT effluents and analysis of the concentrates for mutagenicity/carcinogenicity using in vitro bioassay procedures shall be undertaken. Since no single concentration device can be used to remove all organics of concern, a variety of concentration techniques - polyurethane foam plugs, XAD-2, liquid-liquid extraction, and thermal extraction for low-molecular weight volatile organics, shall be used. To determine if mutagens/carcinogens are present in the form of conjugates, concentrates will be tested after acid- and enzyme hydrolysis.

R804820

"Modeling Transport and Behavior of Pesticides and other Toxic Organic Materials in Aquatic Environments" - A generalized model representing the functional characteristics of toxic organic materials in natural aquatic environments will be formulated, implemented, and tested. It will be compatible with the ecosystem model CLEANER and will have potential application for studying environmental impacts of pesticides in diverse aquatic ecosystems.

R804834

The purpose of this project is the development and application of a membrane electrode system capable of in situ measurement of dissolved ozone. There is a pressing need for such a sensor system, especially in view of recent interest in the utilization of ozone as an alternative to chlorine in water and wastewater disinfection and treatment processes.

An inherent part of this study is the development of a process controlled ozonator for water treatment applications in which the rate of ozone generation is controlled by membrane electrode measurement. This system will be tested on a pilot plant scale and in water supply and waste treatment plants.

Furthermore, the membrane electrode under investigation is inherently capable of measurement of ozone in gaseous and nonaqueous media. The feasibility of these particular applications will also be investigated.

Previous work by the principal investigator resulted in the development of steady state and pulse voltammetric membrane electrodes for dissolved oxygen measurement.

Preliminary investigations on the development of an ozone membrane electrode resulted in a prototype capable of detecting aqueous ozone in the part per billion range, in the presence of oxygen. This electrode system has unique design characteristics and membrane material different from the oxygen membrane electrode.

Further work is needed for the (a) optimization of the electrode design and testing different types of membranes, (b) development of compact, portable, circuitry package for signal processing, (c) determine the electrode performance characteristics in the field, and (d) develop and field-test the process controlled ozonator.

R804836

"Pyrolysis of Agricultural Residues and Feedlot Wastes in a Reactive Steam Atmosphere" - The research program is intended to investigate the effects of diverse parameters, e.g., heating rate and ultimate temperature, particle size, reactor residence time, and pressure on steam pyrolysis in a laboratory bench size reactor.

R804853

The aim of this investigation is to examine the effects of acute exposure to H_2SO_4 mist in humans and some of the factors affecting toxicity--temperature, humidity, and duration of exposure. The subjects will be exposed in an environmental chamber to either filtered air .40 mg/m^3 or .80 mg/m^3 of H_2SO_4 under four conditions of temperature and humidity: 18°C, 45% rh; 35°C, 85% rh; 35°C, 45% rh; and 35°C, 88% rh. Subjects will exercise intermittently at 25% of their maximum capacity during the exposure period. Pulmonary function tests will be performed before, during, and after the exposure. Some aspects of cardiovascular performance will be assessed during the exposure exercise periods.

R804854

The primary objectives of this investigation are:

1. To establish the feasibility of upgrading existing primary sedimentation plants to meet the secondary treatment requirements of PL 92-500 through the installation of rotating biological contactors (RBC's) in the upper half of existing primary clarifiers and a false floor at mid-depth to form a lower secondary clarification zone.
2. To establish the degree of pretreatment and supplemental oxygen supply (if any) necessary to successfully operate an RBC system in this mode.
3. To evaluate the effects of climatic, diurnal flow, and total daily load variations on process efficiency.
4. To establish design parameters and capital and operating costs for the application of this upgrading technique to maximize the use of existing tankage and facilities at other existing primary sedimentation plants.

Operation of Edgewater's converted primary clarifier test module (0.5 mgd±) over the past 2 years has demonstrated to the Borough the potential of the RBC/false floor concept to upgrade performance to secondary treatment levels. However, the existing installation lacks certain control refinements which are necessary to determine limiting conditions of the process as related to hydraulic and organic loadings and diurnal flow variations. It is the intent of this project to provide for the installation of equipment to accurately monitor and control flow and to efficiently remove grit and trash, to provide for the collection and analysis of flow proportional 24-hour composite samples, and to establish and carry out a systematic procedure for evaluating the primary clarifier/RBC test system over a meaningful range of loading conditions and for optimizing process results. The concept will be analyzed on a cost effective and treatment efficiency basis, especially as to its applicability to similar primary plants throughout the country.

R804860

The research proposed for this study would utilize a micrometeorological approach to obtain improved estimates of the total amount and time course of the natural emissions of hydrocarbons from the forest vegetation. Micrometeorological measurements, including vertical profiles of various hydrocarbons, will be made in a forested area near Durham, N. C. at the Triangle Site for the International Biological Program (IBP) Project. These measurements will enable us to calculate the vertical flux of these hydrocarbons and thus their emission rate from the forest vegetation. The proposed research will be a cooperative effort involving personnel and instrumentation from both the IBP project and the Gas Kinetics Photochemistry Branch (GKPB) of the EPA Environmental Sciences Research Laboratory.

The measurements will be made for selected sampling days over a six month period beginning in July, 1976. They will provide daily and seasonal time course estimates of the emission of natural hydrocarbons which can be related to both the physiological activity and water status of the forest vegetation and general climatic conditions. They will give us a better understanding of the importance of vegetation in the production of photochemical smog.

R804875

Objective: To determine the effectiveness of a lake rehabilitation program that includes dredging, and treatment of returning carriage waters, followed by application of aluminum sulfate at Lilly Lake, Kenosha County, Wisconsin.

Approach: Studies will emphasize the effect of treatment on: 1) water chemistry, esp. dissolved oxygen, turbidity, and P and N forms, 2) phytoplankton productivity and chlorophyll _a_, 3) water transparency, 4) macrophyte distribution and biomass, 5) fish growth, and 6) rate of P recycling from the sediments.

Progress: The project will start in 1976.

R804883

It is the purpose of the proposed research to evaluate thirty or more physical and chemical methods for their applicability in analyses of contaminated municipal and industrial leachate streams. This research is necessary since existing analytical methods were primarily developed for analyses of water and wastewater and their direct application to leachate analyses was found to lead to erroneous results. The accuracy of the methods will be tested with the standard addition technique, while the precision will be evaluated by twelve or more participating laboratories. Analyses of variance will determine the between laboratory and the within-laboratory error

R804885

This project is to write the second of two volumes on the toxicology of pesticides. The first of these volumes, published in 1975 by Williams and Wilkins, deals with the general principles of toxicology and with what might be called the epidemiology of pesticides poisoning in man and animals. The second volume will deal with groups of pesticides and with individual compounds within these groups. The two volumes were planned from the beginning as separate parts of a single unified work. This work may be viewed as an expansion of my *Clinical Handbook on Economic Poisons*. Although the *Handbook* enjoyed extensive use in this country and abroad, it contained almost nothing to orient the reader to general toxicology or to the overall picture of pesticide toxicity and storage. Hopefully, that need has been filled by my book, *Toxicology of Pesticides*, now published. It remains to present that part of subject to which nearly all of the *Handbook* was devoted. Attention will still be given almost entirely to compounds that have been studied in man, mainly in connection with occupational exposure or accidental or intentional poisoning, but surprisingly often in connection with planned experiments or therapeutic uses. Special attention will be given to clinically useful information including minimal dosages that have proved dangerous and maximal dosages that were tolerated. No attempt will be made to cover animal studies completely, but those that might contribute to an understanding of poisoning or to its treatment will be reported.

R804886

Objective: To provide a tested and working prototype of a buoyed diffusion chamber array for multi-depth environmental exposure of sewage in aquatic environments to be used to follow the rate of decay of fecal indicators and pathogens of human origin.

Approach: Well-agitated Nuclepore membranes permit the free diffusion of solutes through the pores while both retaining bacteria and viruses and minimizing the Nernst layer, plugging and wall growth. The use of these membranes in a submersible transiucent chamber allows the total effect of in-situ temperature, sunlight, inorganic and organic solutes to be observed on the test indicators and pathogens.

The deployment of diffusion chambers at three depths allows the effect of the conditions near the surface, near the thermocline and below the thermocline or photic zone to be observed simultaneously, as the buoyed array drifts with the sewage plume in the test area. A light-protected closed loop of tubing with a minimal volume of constantly pumped liquid between the cells and the surface buoy permits sampling at intervals of choice from an inflatable vessel without raising the array.

Current Plans:

The prototype will be tested and refined in Rhode Island waters to meet the specifications of the EPA Health Effects Laboratory at West KingstonRI.

S804895

This project would determine the feasibility of using hypolimnetic aeration and nutrient inactivation as a combined treatment to arrest and mitigate the effects of eutrophication in a reservoir.

Lafayette Reservoir is a 126 acre, 4200 acre-foot reservoir in the San Francisco Bay metropolitan area. The reservoir is currently used for recreation and as a standby domestic water supply.

Aeration of the hypolimnion would occur for seven months in each of two consecutive summers. Aluminum sulfate would be applied to the reservoir twice during the first summer - first to the surface layer and then through the aerator to the hypolimnion. The treatments are expected to remove nutrients from the water and sequester them in the benthic sediments.

S804897

"Lake Restoration Demonstration Project by Dredging and Chemical Treatment"
Project will improve lake quality by increasing lake depth, constructing a sedimentation basin, sealing the lake bottom, and installing an aeration system.

S804907

"Steinmetz Lake Restoration Project" - The lake, which is used extensively as a swimming and ice skating facility, suffers from excessive growth of weeds and algae. Applicant proposes to drain the lake during the winter, allow bottom sediment to desiccate, and dredge and bulldoze out sediment in the spring thereby increasing lake depth by one meter. Prior to refilling with water, one foot of sand will be placed on the lake bottom. Also storm sewers discharging into the lakes as well as other surfaced drainage may be rerouted. Monitoring will be conducted for three years to determine project effectiveness.

S804912

"Lake Oelwein Renovation Project - Phase I" - Rehabilitation will consist of dredging sediment from the lake bottom and constructing a siltation basin in Otter Creek prior to its entry into the lake.

R804916

A program is underway to develop a new FT nmr spectrometer system of unprecedented sensitivity for a large class of applications dealing with biomolecular structure and function. The spectrometer uses a wide base 3.5 Tesla superconducting solenoid and is based on 3 rf synthesizers. Essentially all magnetic nuclides will be observable in 15 to 30 mm sample tubes.

Several new applications are being investigated for the new instrumentation; studying environmental toxic materials with emphasis on elucidation of toxin-induced changes in biomolecule structure and function. One project will utilize variable frequency ^{13}C relaxation measurements to elucidate the form of interaction between organic toxins and model membrane systems. Another project involves specialized synthesis of short "native" DNA's and subsequent nmr studies of heavy matal toxin binding and intercalation into the DNA structure. A third application utilizes ^{31}p nmr and ultralarge sample tubes to speciate organophosphorus pollutants in natural waters. The largest (35-50mm) sample tubes will also be used in an attempt to directly observe toxin metabolism/degradation by living cells, using ^{31}p nmr and ^{13}C and ^{15}N nmr (with isotopic enrichment).

R804917

The purpose of this project is to assess the environmental impact of wastewater contaminants originating from the production of synthetic fuels from coal, and to evaluate alternative wastewater treatment technologies for the control of these contaminants. The project is carried out in several phases over a 5-year period consisting of (a) a literature review and survey of pilot- and full-scale coal conversion facilities to identify specific contaminants which might be found in coal processing wastewaters, (b) a study of the biodegradability of selected organic constituents from such wastewaters including an assessment of the aquatic impact of these constituents and biodegradation products, (c) biological and physical-chemical treatability studies of selected organic constituents and identification of the residuals following treatment, (d) animal toxicology studies to evaluate the potential health effects of those wastewater components for which sufficient information is not available in the literature, (e) treatability studies of composite synthetic and real coal-processing waters including analytical characterization and aquatic impact assessment of the treated waters, and (f) development of design criteria for continuous treatment of wastewaters from coal-conversion facilities.

R804926

"Studies of Dust Cake Formation and Structure in Fabric Filtration" To provide data for improved fabric construction in filter fabrics.

S804949

"Rivanna Reservoir Restoration Project" - Project to evaluate efficiency and cost effectiveness of the following nutrient management and lake restoration pilot projects: creation of sod buffer zones along stream banks, construction of residential sedimentation ponds and installation of an aeration system in the reservoir.

R804956

"Fluoescence of Chesapeak Bay Water" - Correlate fluorescence of Chesapeake Bay Water with Total Organic Carbon (TOC) data. At the completion of this program, Chesapeake College will provide EPA with a report detailing results and conclusions.

S804961

1). Objective
to remove silt from the Lenox Municipal Water Reservoir

2). Approach
to remove the silt by dredging

3). Current Plans / Progress
dredging the Water Reservoir was started in 1958 but was not completed because of lack of funds. Lenox will need a Grant to help pay for the cost of the dredging operations.

S804962

"Lake Improvement For Frank Holton State Park" - Project will improve lake quality by significantly reducing suspended solids input input and increasing lake depth.

R804964

The major objective is to quantify the transition zone of vegetation between coastal marshes and their adjacent upland communities in California. By gradient analysis the transition zone will be compared both north to south and from ocean to inland sites in the State.

The approach will be to run transects across the transition zone, noting species abundance and cover at appropriate intervals. Analyses will be made in an attempt to determine recognizable plant assemblages that are indicative of the transition zone,

Current plans include site selection, literature review and planning sessions.

R804965

The primary objective of this project is to develop a comprehensive picture of vegetation and flora along selected transects from the tidal zone through the coastal wetlands to the uplands in the Gulf of Alaska. From this very large region we will select a number of different sites that will reflect regional diversity and provide a test of the hypothesis that floristic data will aid the preparation of more precise definitions of coastal wetlands. Ground photography, plant sampling along transects, and the preparation of plant collections will provide the data base. Individual taxa and combinations of taxa exclusive to wetlands will be sought with special attention to the definition of the limits of the wetland-upland transition zone.

S804969

"Project for the Restoration and Preservation of Environmental Quality at Swan Lake" - Project will reduce erosion by stabilizing the lake shore, installing riprap, establishing anland buffer zone, isolating spoil deposition area and implementing land conservation measures.

R804972

The project objective is to prepare a comprehensive training package, consisting of a number of audiovisual presentations and an accompanying instructional manual, which can be used by government and industry to: (1) upgrade and improve the techniques and procedures for enforcing state and Federal environmental regulations related to surface mining; (2) acquaint regulatory and production personnel with the environmental sciences, the nature, extent and relationship of surface mining environmental problems, and the basic environmental control principles and practices; and (3) explain and illustrate different uses and applications of best available and cost-effective environmental control techniques.

A format which is generic in nature will be utilized in developing the course. The use of such a format is desirable in order to facilitate course utilization throughout the varied and extensive geographic area covered by the IMCC member states. In preparing those portions of the course dealing with the control basis, emphasis will be given to basic control philosophy, principles, and practices rather than a detailed coverage of specific laws and regulations within particular states.

The Draft instructional manual is scheduled for completed in December, 1977.

R804973

"Health Effects of Waste Water Treatment Facility" - A retrospective epidemiological study using existing data from Tecumseh, Michigan and relating to distance from sewage treatment plant.

R804977

1. Objectives: Develop a chemical analysis procedure for rapid measurement of toxic materials concentration in bleached and unbleached kraft whole mill effluents, groundwood effluents and sulfite mill effluents; and relate the chemical assay results to effluent toxicity measured in bioassays using rainbow trout.
2. Approach: The experimental work will be carried out in two phases: a) development of the analytical procedure and demonstration of a relationship between analytical results and effluent toxicity. Also, toxic loadings in effluents from various types of pulp mills.

R804992

Workshop: Ozone/Chlorine Dioxide Oxidation Products of Organic Materials - The primary objective of such a meeting is to determine who is doing what research and testing, where this work is going on, what organic oxidation products are being sought, by what analytical techniques, and what toxicological testing of these organic oxidation products is being conducted.

S805001

"Ellis Brett Pond Restoration Project" - Restore quality of Thirty-Acre Pond and Ellis Brett Pond and prevent future pollution of those water bodies from upstream nonpoint sources. To be accomplished by implementing street-sweeping program in mall and apartment complexes, reduction in peak flow, retaining and filtering runoff from these complexes and installing oil traps.

R805003

That infectious agents are emitted into the atmosphere during the aeration phase of sewage treatment is well established in the literature, but it is not well documented that the viable particle emissions are hazardous to the health of persons residing near the plant site. This study will determine whether or not the health of persons residing adjacent to a sewage treatment plant is significantly different from persons living more distant from the plant site. Field and laboratory studies to evaluate health status will include: 1) a health questionnaire survey; 2) a health watch survey; and 3) examination of school absenteeism records.

R805003 Contiuned

These results will be correlated with analyses of air samples and meteorological data collected at the plant and in the commounity to determine the nature and distribution of the exposure in the community to viable and non-viable particles and gases emitted during sewage treatment. Monitoring non-viable particles and gases is included to determine if they have a role in altering the susceptibility of the exposed population to infections in addition to their direct noxious effects on man.

R805006

The principal objective of this project is to make daily measurements of lung function in healthy non-smoking outdoor workers and relate any changes in lung function to air pollution levels. Out door gardeners at the Shaw Botanical Gardens in St. Louis will have daily measurements of lung function with a body plethysmograph and also daily physical examination and history. The pulmonary function data will then be correlated with daily air pollution levels recorded by the RAPS station on the premises of the garden.

R805012

The primary objective of this project is to evaluate the aesthetic factors associated with land disposal of milled solid waste in a variety of particle sizes without daily cover. Particle sizes to be investigated are 2", 4", 6", and 8". Variables to be evaluated:

- o Effect of wind velocities on debris blowing
- o Differential settlement
- o Initial density and effects of time
- o Plant growth
- o Vectors and wildlife
- o Odors

The results of this study should allow agencys concerned to better evaluate regulations controlling land disposal of shredded waste without daily cover.

R805015

"Engineering Performance of Thermoplastic Water Well Casings" - The primary objective of this proposed program is to provide the engineering data necessary for development of a rational design criteria for thermoplastic water well casings. As a minimum, this design criteria will consider structural, environmental, and assembly aspects of the water well construction.

R805017

"Sulfur Dioxide Pollution: Review and Assessment of Future Measurement Needs from Airborne LIDAR" - This project is to identify and describe sulfur dioxide sources, identify and review existing measurement instrumentation and develop an algorithm to do a computer analysis of sulfur dioxide differential absorption measurement data. The end product of the grant is a final report and a computer program.

R805018

1. Objective: Production of guidelines for quantitative ecological assessment in the marine intertidal benthic environment, applicable to evaluations of pollution effects.
2. Approach: Compilation from literature and unpublished sources of the best available general information on sampling and analyses.
3. Plans: Production of written guidelines for definition of survey objectives, design of sampling plans, procedures and apparatus and data analysis methods. Separate guidelines for rocky and for sandy shores will be prepared.

R805020

The Association of Systematics Collections (ASC), through its Council on Systematics Collections and Environmental Quality, proposed to undertake a pilot study/review of a specified portion of the master species list for the Environmental Protection Agency's BIO-STORET system.

BIO-STORET is an EPA data processing project for managing physical and chemical information derived from water quality studies. In operation, all identifications of aquatic species will be checked against the "master species file;" if the identification does not match, the data will be rejected.

For the BIO-STORET project to be of value, it is essential that the master species file be both complete and accurate. To achieve these prerequisites, an extensive review and expansion of the list must be performed by professional taxonomists; each specializing in one of the groups of organisms of conern to the project.

The project described herein will enlist the aid of qualified taxonomists to: a) review a section of the reference species list for completeness and accuracy of the specific and subspecific names and associated higher taxonomic nomenclature; b) designate those groups in which the species are difficult to identify; c) list those groups currently under study or review and point out problems in the taxonomy of specific groups (such as inter-specific hybrids); d) provide a list of current or pertinent literature references; and e) note the need for development of identification keys to certain biological groups.

The ASC will also furnish the EPA with recommended protocol for performing the expansion and correction of the entire master species file; a critique of this protocol, and estimates of the time and expense required to bring the master species list up to where the BIO-STORET system can perform as it was intended.

R805023

OBJECTIVE: The principal objective of the Third National Conference on Individual Onsite Wastewater Systems is to acquaint the engineer/practitioner with alternative treatment and disposal methods for individual onsite wastewater applications, including the newer wastewater recycle and water conservation technologies and to describe various management practices which have successfully controlled growth, operation, and maintenance of onsite systems.

APPROACH: A single session conference will be used as a forum to achieve this objective. This is the Third National Conference organized by NSF to provide for exchange of information between regulatory, manufacturing, and consumer interests concerned with the treatment and disposal of wastes from individual homes. Federal, state, and local responsibilities will be discussed. Onsite systems as a practical, cost-effective alternative to sewering in complying with PL 92-500 requirements for areawide wastewater treatment management planning (Section 208) may be feasible. Two such community demonstration projects will be described. Regional management plans and numerous state and local experiences will be described. Opportunity for group discussion and exchange of views will be provided.

CURRENT PLANS OR PROGRESS: Arrangements for holding the conference at the Marriott Inn, Ann Arbor, Michigan on November 16, 17, 18, 1976, have been completed. A planning committee has met, developed program content, and selected speakers. Over 90 percent of the speakers are committed.

R805037

"Control of Fertilizer Nutrient Losses in Irrigated Portions of the Pacific Northwest" - The project is designed to develop and prepare a manual of practices for the control of fertilizer nutrient losses from irrigated cropland in the Pacific Northwest. The manual will be useful to the areawide planning agencies responsible for planning and recommending control measures for non-point sources of agricultural water pollution.

R805039

The objectives of the proposed project are: (1) to determine what is currently known concerning approaches to predicting the radial extent and magnitude of pressure buildup around wastewater injection systems. (2) to compile data from selected examples in which the extent and magnitude of pressure buildup around injection wells has been monitored. (3) to compile case histories of pollution problems that have resulted from excessively great pressure buildup around injection wells. (4) to provide recommendations for extension of existing methodology in predicting pressure buildup patterns to meet the needs of regulatory agencies, engineering consultants, and injection well users.

Part (1) of the study will be performed by literature survey and by contact with information exchanges. Parts (2) and (3) will be performed by contact with State and Federal agencies and companies operating injection wells.

Since the project is in the proposal state, no progress has yet been achieved.

R805043

This Symposium should bring together American, European and other participants to report and discuss the current issues on the atmospheric sulfur problem.

It is estimated that the global emission from anthropogenic sources are of the same order of magnitude as emissions from natural sources. However, more than 90% of anthropogenic SO_2 emissions are in the northern atmosphere. It has been recognized that the anthropogenic sulfur problem is a regional one on the spatial scale of thousands of kilometers. The horizontal and vertical dispersion mechanisms, removal rates by dry and wet deposition, SO_2 oxidation rates and mechanisms, the particulate sulfur size distribution, spatio-temporal distribution and chemistry of aerosol sulfur compounds and associated measurement techniques will be discussed.

The Symposium is co-sponsored by

United Nations Environment Programme
Electric Power Research Institute
U.S. Environmental Protection Agency
U.S. Energy Research and Development Administration
American Meteorological Society
under the auspices of
Yugoslav Academy of Sciences and Arts

R805045

Use of Remote Sensing to Determine the Horizontal Distribution of Chlorophyll and Surface Currents in Las Vegas Bay, Lake Mead, Nevada" - To provide EMSL-LV with ground truch support in a form of surface water chlorophyll data.

R805047

"Adaptation of Aquatic Ecosystem Model for Applied Uses" - The Grantee is modifying an existing lake ecosystem model (CLEANER) to adapt the model for basin planning applications. He has encountered a heavy computation burden in testing the model and will require additional computer funds to complete the grant.

R805049

"Tracheal Organ Culture as Air Pollution Damage Indicator" - The specific objective of this study is to determine the effects produced by energy-related effluents on the resporatory epithelium during and after exposure to infectious agents.

R805052

"Oil Spill and Oil Pollution Reports" - The specific objective of the project will be to compole and issue for publication quarterly bibliographic reports containing information on oil pollution. Included will be summaries of (a) oil spill events, (b) bibliographic literature citations, (c) current research projects, and (d) patent summaries.

R8C5055

1. To study groups of men exposed in excess of 5 years to heavy concentrations of DDT to determine whether these show any dose related adverse effects on health when compared to matched "controls" subjected only to community exposure to DDT.
2. Initial cross-sectional study including history of exposure, medical history, physical examination with emphasis on neurological signs, and determination of serum levels of DDT and its metabolites.

   Follow up examinations in the 3rd and 5th years thereafter.
3. Study in 1977 includes cross-sectional study only.

R805066

The purpose of this project is to design and determine the feasibility through a pilot project, if warranted of a study to measure the risk of gastro-intestinal symptoms and hepatitis attributable to consuming uncooked hard shell clams (Mercenaria mercenaria) which are harvested from approved growing areas and which satisfy the shellfish meat criteria with regard to bacterial contamination. The project is to be coordinated with a project already underway at the Environmental Protection Agency's Health Effects Research Laboratory concerned with measuring viral and bacterial levels in shellfish.

R805067

The International Environmental Programs Committee serves as the U.S. National Committee for the Scientific Committee on Problems of the Environment (SCOPE) of the International Council of Scientific Unions (ICSU). The purpose of SCOPE is to advance knowledge about the influence of human activities on the environment, and to serve as a non-governmental source of advice on environmental problems.

R805070

1. The primary objective of this research is to determine the effects of halogenated aromatic compounds on the metabolism of foreign organic compounds. In addition to evaluating which compounds alter xenobiotic metabolism and at what dose levels, the effects of metabolism of the halogenated compound and its storage and subsequent release on the prolonged induction of xenobiotic metabolism will be studied.
2. Rats will be dosed po with the compounds of interest at multiple dose levels for time periods ranging from 14 to 90 days and both *in vivo* and *in vitro* parameters of xenobiotic metabolism will be measured. In the studies on prolonged effects, animals will be dosed and storage and excretion of the compounds followed and correlated with changes in xenobiotic metabolism.
3. The compounds of interest for storage and activity correlations are the brominated and chlorinated benzenes. The inducing potential for halogenated benzoquinones will be assessed by measuring a number of parameters including EPN detoxification, glucuronyltransferase, azoreductase, benzpyrene hydroxylase, cytochrome P-450 content and cytochrome *c* reductase activity. In the porphyrin studies, hepatic and urinary porphyrins and precursors will be measured during the administration for periods of up to 120 days of halogenated benzenes.

R805090

The objective of the project is to characterize and evaluate the published and unpublished environmental information on freshwater marshes in the areas of (1) production and chemical composition (2) nutrient cycling (3) decomposition and (4) research value.

Each of these 4 major areas of marsh research will be examined in depth during a three day conference of marsh investigators from the United States hosted by Rider College and The Center for Coastal and Environmental Studies, Rutgers University at the Continuing Education Center at Rutgers University in New Brunswick, N. J. The conference will be structured around half-day sessions utilizing the following format: (1) short summary papers that assess current knowledge and presently available methodology for various marsh systems including bog and pond marshes, river marshes and freshwater tidal marshes, (2) extensive discussion following the summary papers with the focus on gaps in our current knowledge and the most appropriate methodology for closing the gaps, (3) evening sessions where the authors of the summary papers are responsible for synthesizing the discussion generated in their session and developing a set of recommendations for filling the gaps in our current knowledge.

The final day of the conference will be devoted to consideration of the workshop generated papers with emphasis on establishment of standardized methodology for future marsh research and generation of specific proposals to answer unresolved questions.

R805091

The overall objective of this research program is to evaluate the alveolar macrophage response in several species of animals consequent to the inhalation of standardized sulfate particulates, sulfuric acid, and sulfur dioxide (with and without ferric oxide particles). The optimum concentration of particles, particle size, and time of sacrifice of the test animals are being determined in preliminary studies. A number of measurements of the response of free cells to these particulates will be made, such as the total number and size of free cells available, viability of free cells, phagocytic capability, and other physiological and biochemical responses.

During the first year of this study, the techniques of aerosol generation were developed to generate metal sulfate and iron oxide aerosols in sulfur dioxide atmospheres. Using this methodology, groups of hamsters were exposed for four hours to sulfur dioxide gas alone andiron oxide (Fe_2O_3) aerosols alone, as well as the combination of the two. Interestingly, when hamsters were exposed to concentrations of both SO_2 and Fe_2O^3at 50 ppm and 10 mg/m , respectively, a marked reduction in alveolar macrophage endocytosis of radiocolloidal gold was observed in animals exposed to Fe_2 O^3 aerosols containing small particles (MMAD= 0.15 pm) with large surface areas. This depression in phagocytic function remained for more than 24 hours and did not appear to return tonormal, control levels until 48 hours following $SO_2$and Fe_2 O^3 exposure. During the next budget period, we plan to further investigate the possible additive and synergistic effects of the interaction of SO_2 gas and Fe_2O_3 aerosols and also to investigate three sulfate species.

R805102

The principal objective of this project is to evaluate the recoverability of coliforms from waters which have: a) high populations of non-coliform organisms; and b) high levels of turbidity due to natural mineral turbidity, hydrated oxides and organic debris. An attempt will be made to distinguish the physical interference effects of turbidity from those effects caused by the growth of competing organisms. This may be accomplished by:
a) selecting turbidities which vary in their microbial content,
b) selectively reducing the microbial content of a turbidity, and
c) separating the turbidity from its source water and totally removing the microbial content by sterilization. The extent of inhibition of coliform recovery and the interaction of these various factors will also be considered.

A secondary objective is to determine the mechanism of inhibition. The most likely possibilities are: a) competition for nutrients, b) liberation of an inhibitory substance by the non-coliforms, and c) overgrowth of the coliforms by non-coliforms on laboratory media.

R805106

The purpose of the second year of the program is to finish the studies of (1) the utilization of Cladophora by herbivores and omnivores, and (2) the effect of selected chemical factors on the growth of C. glomerata. We will continue the studies started in the first year to isolate factors that cause C. glomerata to be an unsuitable food source for the snail Physa heterostropha. A new approach will be to determine if naturally occurring bacteria, viruses, and fungi may act as a control of C. glomerata.

The 1977-78 program of work is divided into four major parts with emphasis on biological control of C. glomerata. These are:

Part I------	The importance of C. glomerata as a prey species for various invertebrates and fish.
Part II-----	The chemical analysis of the nutrient value of C. glomerata and the characteristics of Cladophora which make it an unsatisfactory food for various organism, particularly the snail Physa heterostropha.
Part III----	The control of C. glomerata by naturally occurring species of bacteria, viruses, and fungi.
Part IV-----	The effects of heavy metals common in polluted water on the growth of C. glomerata.

R805112

The fundamental objective of the burn tests is to develop data that may be translated into design criteria for the fabrication of equipment to be used for the incineration of kepone and kepone contaminated waste. The activities required to fulfill the objective are indicated in the below:

determine the time/temperature relationship of the incineration process in order to destroy kepone and its hazardous by-products.

develop the thermal requirements for complete decontamination of waste products containing kepone.

to substantiate the findings by D. S. Duvall and W. A. Rubey in their technical report entitled "Laboratory Evaluation of High Temperature Destruction of Kepone and Related Pesticides". This work was done under flameless conditions.

R805125

The objective of this research project is to perfect an in vitro technique for the rapid screening of teratogens. The plan of approach is to analyze the effects of organ specific teratogens on the development of the embryo in vitro. Teratogens will be administered to rats on selected days of gestation and the embryos recovered 24 hours later. These embryos will be cultured for periods up to 48 hours after recovery. At the end of the incubation period the organ systems will be studied macroscopically and microscopically for signs of abnormal development.

R805126

(1) Objectives: To determine if bioaccumulated organochlorides or other chemical residues play an etiological role in Reye's Syndrome by comparing levels of such toxicants in the adipose tissue, liver, brain, and possibly other tissues of victims who die of the disease to levels in a control group of children who die of other causes. Another objective is to obtain baseline data regarding the load of such persistent toxicants being carried by children in the Great Lakes area.

(2) Approach: A case-control autopsy study will be designed and a gas chromatograph mass spectrometer/computer used to identify and quantify for chemical residues including chlorinated hydrocarbon pesticides.

(3) Current Plans: Analytical techniques will be worked out. Sources of cases and paired controls found, either by pre-designating certain medical centers in the Great Lakes region or by waiting for Reye's Syndrome to occur and then arranging with pathologists in the area to provide specimens. Specimens will be shipped on dry ice to the EPA Environmental Research Laboratory, Duluth where facilities for the project have been provided. If good data is generated, the results will be published.

R805128

The objective of the proposed project is to enhance water management through recovery and recycle of warp size materials in textile slashing and desizing. The approach will involve the evaluation of warp sizing polymers which precipitate when the desize wastewater is heated. Applicability of the recoverable size materials will be evaluated in pilot plant tests and in production processing tests. Economics of the process will be evaluated. Environmental impact will be determined. Relative energy requirements for the process will be studied.

R805131

This is an initial effort to develop a generalized planning model for evaluation of alternative forest management practices as a function of environmental and resource goals. The objectives of this study are: 1) To develop and test a water and sediment routing and yield model for both small and large watersheds and for both short and long term periods. 2) To develop and test a process model which will simulate the erosion and deposition of channel banks for unstable channels in forested upland watersheds. To incorporate this process model into the developed water and sediment routing model the remaining objectives will be: 3) To develop a procedure for routing forest litter from the land surface for predicting the loading of stream channels with organic debris. 4) To interface on available nitrogen and phosphorus sediment uptake model with the developed water and sediment routing model. 5) To develop a thermal loading model for predicting the temperature and dissolved oxygen of water loading to the stream, and 6) To link the cause-effect process model and the multiple-objective programming model for the selection of forest management alternatives. In order to meet the above mentioned objectives the proposed study will develop numerical models considering the physical significance of the governing processes.

R805133

Two-hundred thirty-five water samples will be analyzed, qualitatively and quantitatively, for species of planktonic diatoms. The samples, now concentrated and preserved, were taken year-round from 5 locations on 47 separate dates from a water intake of a railroad ferry on a transect across Lake Michigan. Analysis of these samples will identify possible differences between the diatoms of inshore and offshore waters and provide the first year-round data of the diatom community in offshore as well as inshore waters of Lake Michigan.

The diatoms will be cleaned with nitric acid and placed on 0.45µ membrane filters. A portion of each filter will be made transparent with immersion oil and examined at 1000x under phase contrast. Hyrax slides will be prepared, where appropriate, from duplicate samples to aid in species identification.

Various graphical displays and biometric analyses of the data such as contour and isometric projection graphs, principal components analysis and hierarchical grouping will be used to aid in interpretation of the data. Multiple regression and canonical correlation analyses will be used to determine structural relationships between physicochemical parameters, previously analyzed, and the diatoms.

R805141

"Effect of Industrial Particulate Emissions on Alveolar Macrophages"
The objective of this proposal is to determine if a correlation exists between invitro toxicity tests of industrial particualte emission and in vivo exposure using indentical parameters to measure effect.

R805144

1. Objectives -

   Attempt to propagate hepatitis A virus (HAV) in all cell culture and/or animals.

2. Approach -

   Unique tissue culture cell systems (spinner, ferret, gerbil) will be used and subtle effects of viral growth assayed.

3. Current Plans

   (a) Human Amnion cells in spinner culture will be infected with positive HAV material and the cells assayed for cell count, viability, nucleic acid biosynthesis, F.A. antigen and radioimmune assay activity.

   (b) New cell lines from ferrets and gerbils will be established and inoculated with HAV. After 4-5 days of incubation the inoculated cells will be superinfected with a RNA or DNA virus and viral interference documented.

   (c) Newborn ferrets will be inoculated with HAV materials and followed for evidence of infection.

R805146

The basic problem to be approached is a continured assessment of the degree to which specific site binding mechanism operate in species which occupy habitats subject to heavy metal contamination in the Great Lakes. Studies are also proposed to evaluate toxic symptoms and stress levels of heay metals on species collected from these sites and incubated in the laboratory with additional heavy metals. A cellular approach will again be used to assess these problems in order to mitigate the problems associated with bulk analysis and extraction procedures. In particular, x-ray microanaylsis will be used quantitatively measure cellualr changes occurring with heavy metal exposure.

Research conducted to date has demonstrated that havy metal binding with polyphosphate occurs in the field and in laboratory cultures of some diatoms. It also appears that heavy metal exposure may cause a proliferation of cellular membranes at minmal doses.

R805148

Traditionally, developments in particulate-gas separation equipment have been slow in starting, as evidenced by the fact that today's basic equipment differs little from that in use 100 years ago. One major reason for the lack of progress is that successful innovation requires field trials, where the cost of failure to the trial plant is large. Moreover, air pollution control equipment mostly considered as non-productive economic burdens on the processes to which they are applied. As a result, control devices so far have received minimum attention, and incentive for research and development to improve their performance is lacking.

Recently there has been a substantial growth in research dealing with new concepts and methods in particulate-gas separation such as high gradient magnetic separation, acoustic coagulation, separation by filters in an electrostatic field, etc. In order to identify new research areas associated with these concepts and methods, as well as to stimulate further research activities in these fields, it is proposed to organize a research workshop on the novel concepts, methods and advanced technology in particulate-gas separation. The proposed workshop will be held on the Campus of the University of Notre Dame for about two and one half days around the third week of April 1977 and about thirty-five prominent scientists and engineers in relevant areas will be invited.

R805151

This proposal outlines a project aimed at faciltating the dissemination of information pertaining to animal production's impact onenvironmental quality. This will be accomplished by searching the literature, abstracting pertinent publications, publishing water-related abstracts in *Water Resources Information Abstracts*, and submitting a cumulative bibliography of abstracts to the Environmetnal Protection Agency for publication at the end of each budget periodc The publications to be abstracted will be examined for the following topics: (1) The environmental impact of animal production activities on water, ground water, air, soil systems, health, and aesthetics. (2) Feedlot, confinement pen, rangeland, and pasture land management, including animal waste management; the use of chemical fertilizers, manures, green manures, and sewage sludge in conjunction with animal production areas; the use of pesticides in conjunction with animal production areas or animal production-related areas; and pollution effects fo crop residues, soil losses and sedimetns production from animal production areas to animal production-related areas. (3) Legal, economic, and social constraints. (4) Research and development. The project staff eill maintain a file copy of all articles which apper in the bibliography, Upon request to the project staff, users will be supplied a copy of individual articles at cost.

R805170

The objective of the project is development of a two-layer, dynamic model of estuarine hydrodynamics and water quality. The model employs the node-link modeling approach first used extensively by Orlob and currently used in the EPA's RECEIV-II model. The model, called RAMSES, builds on the basic, one-layer RECEIV-II model, incorporating variable layer thickness and inter-layer exchanges. Initial coding of the hydrodynamics sub-model is complete and tested for one-layer conditions. Further testing and demonstration of the hydrodynamic sub-model is to be accomplished on a two-layer case, along with a sensitivity analysis. Completion of the hydrodynamic sub-model will permit commencement of water quality sub-model testing for one- and two-layer cases.

R805197

This symposium is designed to bring together persons concerned with the application of analytical chemistry to the solution of environmental problems. Applied environmental chemists will hear approximately 20 invited speakers present the latest developments in a variety of analytical techniques. Plenary lecturers will address broad environmental problems whose solutions depend on analytical chemistry.

Technical sessions will center upon three areas: identifications of organic species, elemental analyses by physical methods, and special environmental pollutants.

R805201

Background

There is little or no nationally verified data on the impacts of urban stormwater runoff on receiving waters. Impact data is needed to determine in a rational way the degree of wet weather pollution control required. Studies are needed to determine the degree of pollution in receiving waters caused by combined sewer overflows (CSO). Priority should be given to sites that show a potential for a dissolved oxygen (DO) sag to occur as a result of the CSOs and have receiving water and site characteristics that will enable field verification of unsteady state water quality prediction models.

Due to the paucity of wet weather DO data field surveys are needed of potential sites to determine their suitability for indepth CSO impact studies before final selection of study sites can be made.

Objective

This task will primarily involve the field measurement of DO in twelve (12) Ohio streams receiving CSOs from municipal systems to determine if a DO impact occurs during periods of urban runoff. This data will be used to make decisions on the feasibility of additional in-depth studies.

R805236

The workshop will provide a forum for discussion of public policy for ground water quality protection. The workshop is for approximately 100 persons with expertise and management responsibility for ground water and who are concerned with public policy issues which impact on its quality. Discussion issues include the extent of degradation allowable and ramifications associated with specific degradation policies. Consideration will be given to public policies related to various activities which constitute potential sources of ground water contamination. Participants will attempt to evaluate the feasibility of a national policy on ground water quality and the means of modifying existing policies to give due regard to potential impact on ground water quality. An assessment will be made of potential effectiveness and long-range implications of specific federal and state programs concerning ground water quality protection. Weaknesses in existing laws and administrative structure will be identified as a foundation to support recommendations for future policy on ground water quality protection.

R805250

Objectives

To determine the long-and short-term issues emerging from the further development of eastern and western United States coal as a parallel source to nuclear energy, and to place these issues in some order of priority

To formulate a data base that will serve as a primary information tool for the Forum

To bring together the people who are knowledgeable in the science and technology of coal extraction and use with those who are questioning and apprehensive about its use

To identify areas of conflict concerning the use of coal, with close attention given to health-related effluents, the question of CO_2, and to explore avenues of resolution

To separate and sharpen issues of scientific fact and interpretation from those of value judgment, reducing factual error and misrepresentation through informed discussion and high-level debate

To communicate the results of the Forum process to the makers of national policy related to coal

Approach

The Forum of the National Academy of Sciences offers a public platform for the appraisal and illumination of national issues involving the uses of science and technology

A public audience will include the full spectrum of those who are responsible for initiating change through science and those who are affected by it: members of congressional staffs, advisors and consultants to the federal establishment, members of regulatory agencies, state and local officials, representatives of industry, members of the scientific community, public interest lawyers, press and media representatives, and the interested public. The Forum will be held April 4-6, 1977, in Washington, D.C.